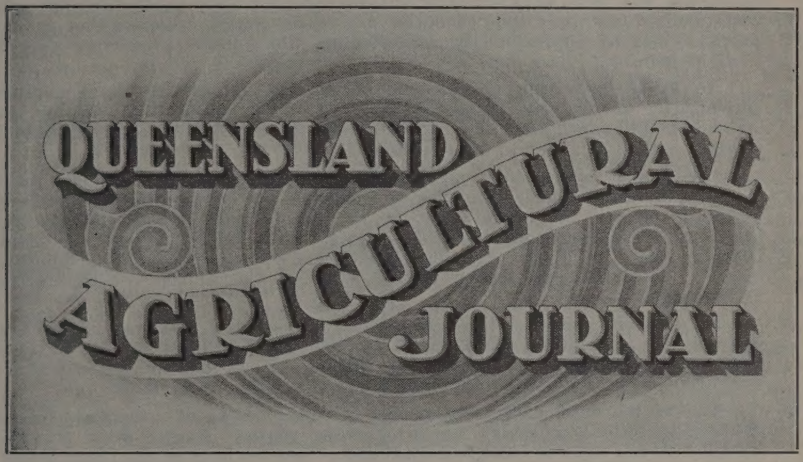
ANNUAL RATES OF SUBSCRIPTION.

Farmers, Graziers, Horticulturists, and Schools of Arts, **One Shilling.** Members of Agricultural Societies, **Five Shillings,** including postage. General Public, **Ten Shillings,** including postage.



VOL. XL. 1 SEPTEMBER, 1933. PART 3.

Event and Comment.

The Governor's Speech—A Record of Rural Progress.

IN opening the Second Session of the Twenty-sixth Queensland Parliament on Tuesday, 15th August, His Excellency the Governor, Colonel The Right Honourable Sir Leslie Orme Wilson, reviewed, in the course of his speech, the progress of country life in this State during the year, and forecast new legislation that will have an important bearing on our rural industries. His Excellency said that since he opened Parliament in August of last year he had travelled over 19,000 miles in visiting various parts of Queensland, and everywhere he had found a very real sense of loyalty to the throne and person of His Majesty the King, and, as his representative, he had been given a most warm and generous welcome in every town or district he had visited. "While we are at the moment," he said, "passing through difficult times, which are, unfortunately, to be found in every part of the world, I can feel nothing but confidence in the future of this State. The fertility of the soil and the character of the people are assets which no temporary depression can destroy, and I feel convinced myself that, with vision and determination to succeed, Queensland must advance along the road to full prosperity and commercial greatness."

Following are other excerpts from His Excellency's speech, which are of especial interest to primary producers:—

> The Queensland Government has done more to assist the wool industry during its period of depression than any other Government in Australia. Most sheep-grazing land in Queensland is held under lease from the Crown as grazing selections and pastoral leases, and very valuable concessions have been granted by the Government. The season has not been generally favourable to the sheep and wool industry. Generous and unexpected rain in July gave State-wide relief, and should ensure a good spring. Happily for all concerned, the prices realised for wool appreciated towards the end of the wool-selling season. There is reason to think that the advance is sound, and that even better prices may be looked for in the future.
>
> The 1932 sugar crop yielded 514,000 tons of sugar, valued at £9,700,000. The reduction from the previous season's yield was due in a large measure to the subnormal season which prevailed in the southern sugar areas.

The cotton-growing acreage further expanded during the past season, and the total yield will probably reach 11,000 bales for this season.

The climatic conditions experienced over the dairying areas of the State during the past year were generally unfavourable for dairy production, but notwithstanding this the output of butter during the period exceeded that of the previous year by approximately 5,000,000 lb., while cheese production showed a slight increase.

To assist in solving the many problems associated with the profitable development of extensive areas of fertile tropical jungle lands having an assured rainfall which are to be made available shortly for settlement, a tropical research station is about to be established.

Pig raising is becoming an increasingly important factor in our rural economy, and to give added stimulus to production my advisers intend launching a definite scheme for improvement of the pig industry, which will provide for financial assistance to approved farmers. In co-operation with the Meat Industry Board, the Board of Animal Health, and other interests, a pig industry research and experiment section will be added to the Animal Health Station at Yeerongpilly.

My advisers recognise the desirableness of assisting farmers and settlers through the Agricultural Bank in all suitable cases with as few restrictions and in as liberal a manner as possible. During the last financial year advances amounting to £354,000 were approved under the Agricultural Bank Acts.

One of the most distressing phases of the problem of unemployment is the lack of suitable openings for our growing youths. Among other projects my advisers have planned the farm training school for boys at St. Lucia, which was opened in January last, and it is gratifying to record that success has attended the project. Practical instruction is given in pioneering and the routine work of farm and dairy and, generally, everything possible is being done to fit the boys for country life and industry. As a greater incentive to earnest trainees, two scholarships tenable at the Queensland Agricultural High School and College will be granted at the end of each half-yearly period. My advisers have also adopted a scheme for rural training of youths direct by the farmer. Although the scheme is really only yet in its infancy, 252 youths have been allotted to farmers. In addition, through its co-operation and assistance, the total number of boys placed in permanent farm work from the Riverview Training Farm has reached 200.

During the year which has just closed, Main Roads Funds have been devoted largely to the construction of roads of a developmental character, particularly in Northern Queensland. The improvement of roads in settled areas has also progressed continuously throughout the year, and, on the average, employment has been given to 3,750 men per month. The Government intends to pursue a vigorous road construction policy during the current financial year.

A new policy has been embarked upon at the Aboriginal settlements under which the natives are, as far as possible, to be trained in the various crafts necessary to carry on the work of the settlements, and it is expected that these will, in time, be staffed almost wholly by natives, stimulating racial pride and confidence, and removing that inferiority complex which is one of the main factors in the destruction of the native race.

Among other proposals to be brought before Parliament, and which were listed in His Excellency's Speech, are:—A Motor Spirit Bill; a Main Roads Bill; a Land Bill; an Unproductive Private Land Development Bill; a Grazing Districts Improvement Bill; an Irrigation Bill; a Wire and Wire Netting Bill; a Tobacco Industry Protection Bill; a Pig Industry Bill; a Dairy Industry Stabilisation Bill; a Primary Producers' Organisation and Marketing Bill; and a Regulation of Cane Prices Bill.

Let us go Forward !

"LET us go forward, everyone working to make full use of the natural wealth that Providence has given us."

Such was the stirring appeal which His Excellency the Governor (Sir Leslie Wilson) made at a Show week gathering representative of all sections of public, professional, and industrial life. His Excellency stressed the need for extending the markets for Australian produce, and urged the wisdom of effecting trade treaties with friendly countries.

His Excellency congratulated the Royal National Association on having been able to secure a man of the calibre of Sir Donald Cameron as its president. Proceeding, Sir Leslie Wilson said he had derived much pleasure and profit from his travels through Queensland, and was glad now to have the opportunity of learning still more from the Show, as to the wonderful resources of the State. To-day we were living in extraordinary times. He could not believe that at any time in the past the world had been faced with such a serious crisis as at present. The people of Australia, however, could consider themselves fortunate in living in a primary producing country so richly endowed by Nature. The country's recuperative powers were such that, without undue optimism they could see some blue in the clouds that surrounded the world.

They had been looking for some good results from the World Economic Conference which had been sitting in London, but it was no use their shutting their eyes to the fact that the conference had not been fruitful of very great results. He thought the reason for the failure was very evident. The conflicting interests of so many nations made success virtually impossible. He had been informed in a letter from a very important person in London that, while Britain and the Empire generally were prepared to go a long way in order to secure agreement, there were other nations who could not see eye to eye with them.

Sir Leslie said he believed that people in Australia had learned that they must co-operate with other nations if a better state of affairs were to be brought about. Firstly, they must find work for the many thousands of unemployed in their own State, and, secondly, it behoved them to find useful employment for the 5,000 lads in Queensland who came to the working age every year. The country must be able to sell its exportable produce, which increased in quantity and quality every year. Each year more and more land was placed under closer settlement, and during the past year it was pleasing to note that 5,000,000 acres had been placed under occupation. Although he did not wish to comment on the subject of policy, he thought he could say that that was a wise and far-reaching course to pursue, and one which, he hoped, would be carried fully into effect. Closer settlement must lead to increased production, and must yield more for export.

His Excellency recalled that some years ago he met the late Mr. Alfred Deakin in London, and heard him make a notable speech, in the course of which the then Prime Minister of Australia said: "In all matters of commerce and trade it is the buyer who is the king, and the seller who is the courtier." Queensland had goods to sell; Great Britain had been, was now, and always would be our best customer, but it seemed to him that the time must come—and it would not be very far ahead—when Great Britain, with all the best will in the world, would be unable to take all Australia's exportable surplus. All the Ottawa agreements and treaties could not be expected to increase the capacity of a man's stomach. At present Britain took about 53 per cent. of our exportable produce, and Japan only 11 per cent., while Malaya, India, the Dutch East Indies, and other countries who were geographical neighbours of Australia took a very small percentage.

It was essential that Australia should find markets for her products, and he would suggest that attention be paid to the striking figures of overseas trade. Action should be taken to cultivate friendly commercial relations with proximate countries—some with huge populations and others that were smaller—in order that trade agreements might be effected, which would give greater security in regard to the future prosperity and welfare of this country and its people. "Progress must be made," concluded His Excellency. "Let us go forward, every one working together, to make full use of the natural wealth which Providence has given us. Let us make this State one of the brightest jewels in the diadem of the British Crown."

Women on the Land.

"IN lauding the improvement in primary production Queensland must pay deserving tribute to the work of the women on the land," declared the Premier (Hon. W. Forgan Smith) at a Show week function.

The Premier was discussing his impressions of the Royal National Show. Much was heard of the value of the man on the land, he said, but in his estimation the value of the women on the land was of equal importance to the State. Those exhibits which bore evidence of the handiwork of women must impress the observer. They indicated the wonderful part that women played in the development of the country and of primary production. The Premier added that he had been impressed by the improvement shown in the dairy stock. The fruit and cotton sections were also most impressive, and he had been particularly interested in the district and one-man farm displays.

Bureau of Sugar Experiment Stations.

CANE PEST COMBAT AND CONTROL.

THE GREYBACK BEETLE.

(September Notes.)

By EDMUND JARVIS.

It is proposed to publish each month a short paper describing the movements of this insect, either above or below ground, according to the time of the year; together with descriptive details of a nature calculated to assist canegrowers in the study of this pest in every stage of its life cycle. Mr. Jarvis's entomological notes are always interesting, and this additional monthly contribution will be welcomed by our readers who are engaged in the sugar industry.—EDITOR.

PREDOMINANCE OF THE PUPAL STAGE OF OUR GREYBACK BEETLE.

THE month of September is essentially associated with the pupal condition of this cockchafer, and it will be found that 90 per cent. or more of the specimens unearthed during the course of deep ploughing or breaking up of old cane lands are examples of this curious stage in the life of our greyback. The pupa of a beetle corresponds to the co-called chrysalis form in butterflies, representing a period when locomotion and feeding ceases altogether for a time, while the life juices of grub or caterpillar undergo a marvellous transformation into what has been termed the perfect state of an insect.

These seemingly innocent phases of life, however, although defenceless, non-aggressive, and motionless, represent in the present case a future destructive brood of cockchafers, a fact which canegrowers should always bear in mind when preparing such ground for planting. Remember, that the grubs derived from eggs of a single greyback (thirty-six in number) are able, under favourable conditions, to destroy six stools of cane. (The plate for this month indicates a period of temporary inactivity, the ground being occupied only by mummy-like pupæ of our greyback cane beetle, each lying motionless in its tomb-like cavity. Above them is a newly planted cane sett starting to grow.

Construction of the Hand-injector.

The appliance being used in North Queensland for fumigating cane grubs is an injector manufactured by John Danks and Son, of Melbourne and Sydney.

The accompanying drawing shows its internal arrangement and the method employed for ejecting from the spear varying quantities of liquid fumigant. Special attention should be given to the position of the different washers, indicated in black, as these have to be renewed occasionally when worn out. In this connection the following advice from the Assistant Entomologist at Meringa Experiment Station, Mr. J. H. Buzacott, regarding possible sources of such trouble and how to deal with them, will be found invaluable, and should be carefully studied:—

"1. Washers L and V sometimes require replacing. This is denoted by external leaks at L or V.

"2. Main pump washer G frequently requires tightening or replacing. To tighten, screw up nut J after first unscrewing compression chamber assembly from tank assembly. To replace washer, remove nut J and pull out old washer with a piece of wire. Wind about 2 inches of a narrow strip of raw hide round plunger, and force into cavity with a wire. Then screw nut J back into place and tighten gently. If this washer requires tightening or renewing, it is shown by weak pressure of injection.

"3. Ball valve seat H sometimes has dirt on it, and this also causes weak injection. The remedy is to clean the valve well.

"4. If the pump leaks at the bottom hole when the spring plunger is up, the cause is a faulty washer X, a bent compression valve stem R, or insufficient tension on valve spring Q, owing to nut Y not being screwed up sufficiently tight. To replace washer X, unscrew spear from compression chamber assembly at V, take off nut Y and remove old washer. Cut new leather washer to fit in recess in Y and with central hole to fit on stem R. Rescrew Y on R and adjust tension so valve does not leak. If a bent valve stem R is the trouble, the whole valve assembly must be screwed out by means of a special box spanner, which fits over squared portion U. The valve stem is then removed and straightened. When replacing valve assembly the washer S must be in good order.

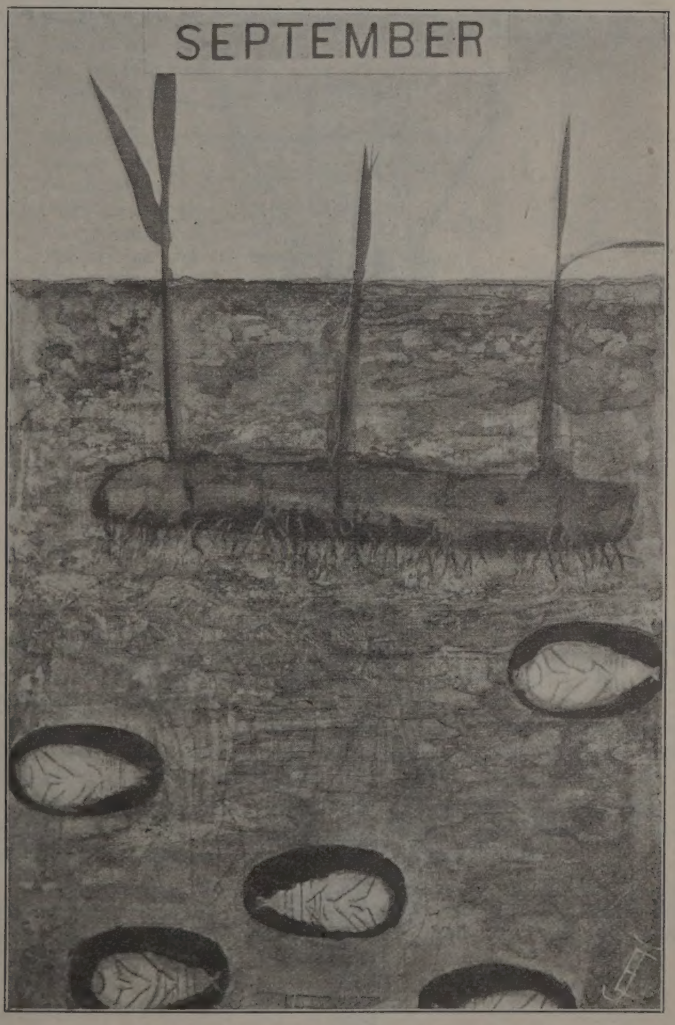


Plate 59.—Pupæ of greyback cockchafer lying under cane sett; awaiting transformation into beetles (about half natural size).

"5. Should it be found difficult to press in the plunger of the injector, it will probably be due to the delivery passage Z being blocked. This may be freed by passing a thin wire through it.

"6. It sometimes happens that the main spring will not return the plunger to its proper position. Usually this is caused by the pin retaining the brass collar about half way up the plunger having sheared, thereby releasing tension on the spring. The old pin must be driven out and the collar held in its correct position by means of a new steel pin riveted in position. A broken main spring or a bent plunger can cause the same effect. For the former a new spring is necessary, and to cure the latter it must be removed and straightened.

Note.—An injector will not work correctly if the hole in the stopper of the tank is blocked up. Some operators place pieces of grass in this vent to prevent splashing, but if this is done the instrument will not deliver the correct dosage, owing to the vacuum created within the tank preventing the liquid from running freely through passages E and F.

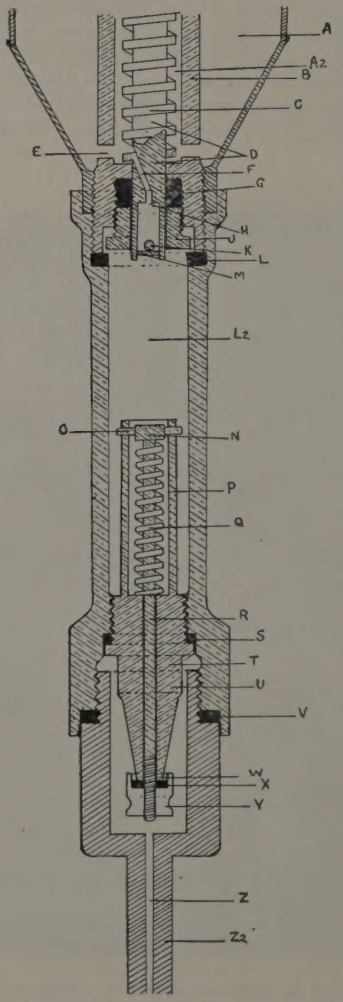


PLATE 60.—Internal mechanism of Danks' Hand-Injector, showing positions of washers, springs, valves, delivery passage, &c.

KEY TO DIAGRAM OF DANKS' INJECTOR.

A. Main liquid container or tank.
A2. Spring guide chamber.
B. Main spring guide.
C. Main spring.
D. Plunger rod.
E. Passage between tank and guide chamber.
F. Passage through plunger rod.
G. Main pump washer.
H. Ball valve seat.
J. Nut retaining pump washer.
K. Ball valve.
L. Upper compression chamber washer.
L2. Compression chamber.
M. Pin retaining ball valve.
N. Collar retaining compression valve.
O. Guide pins.
P. Compression valve spring guide.
Q. Compression valve spring.
R. Compression valve stem.
S. Compression valve guide washer.
T. Compression valve guide.
U. Squared portion for box spanner.
V. Spear washer.
W. Valve seat.
X. Leather valve washer.
Y. Knurled nut adjusting tension of valve spring.
Z. Delivery hole or passage.
Z2. Spear.

TO NEW SUBSCRIBERS.

New subscribers to the Journal are asked to write their names legibly on their order forms. The best way is to print your surname and full christian names in block letters, so that there shall be no possibility of mistake.

When names are not written plainly it involves much tedious labour and loss of valuable time in checking electoral rolls, directories, and other references. This should be quite unnecessary.

Some new subscribers write their surname only, and this lack of thought leads often to confusion, especially when there are other subscribers of the same surname in the same district.

Everything possible is done to ensure delivery of the Journal, and new subscribers would help us greatly by observing the simple rule suggested, and thus reduce the risk of error in names and postal addresses to a minimum.

Cutworm Control.

By ROBERT VEITCH, B.Sc. Agr., B.Sc. For., F.E.S., Chief Entomologist.

THE present issue of the "Queensland Agricultural Journal" is an appropriate one in which to draw attention to the measures that may be adopted for the control of one of the most important insects associated with Queensland crops. The species selected for discussion this month is the brown cutworm, which is annually responsible for losses of a varying degree of intensity. The necessary procedure for dealing with this pest is indicated in the following paragraphs, which also include a short description of the insect whereby it is hoped that growers, who may not be acquainted with it, will be able to identify the species for themselves.

The Brown Cutworm.

Cutworms are the larvæ of certain species of moths and are so designated because of their habit of attacking the stems of their host plants at or near ground level, thus causing them to topple over. They shelter in the soil during the day and feed at night, and as a result of their nocturnal feeding habits growers are often puzzled to account for the loss of young plants. If these losses are due to cutworms an examination of the soil to a depth of one or two inches will reveal the presence of the insects.

The most destructive Queensland species is the brown cutworm, *Euxoa radians* Guen., its activities being particularly serious during the spring months. When full grown, this cutworm (Plate 61) is about one and a-half inch in length or even longer, and is a stout soft bodied, grey-brown or grey-green grub, sometimes possessing a faint pinkish tinge.

The destruction of seedlings is not the only baneful activity of cutworms, for well grown plants may be more or less defoliated. It is also important to note that the work of these pests is not necessarily confined to the plants on or in the immediate vicinity of which the moths laid the eggs from which the cutworms hatched. Where pressure of population is great and food supplies are nearing exhaustion, migration may take place—e.g., cultivated plants may be destroyed by an invasion of cutworms from an adjoining weedy fallow or abandoned area.

Cutworms attack a very wide range of host plants, losses being particularly severe in cotton, tomatoes, tobacco, maize, and vegetables. The commonest weed host plants are pigweed and bullhead.

Control.

Fortunately the control of cutworms is a relatively simple and inexpensive matter. In the first place, cultivation should aim at the prevention of the growth of weed host plants in the area to be planted up and, once it is planted, weeds should be kept well in check. Should they get out of hand and become heavily infested with cutworms they should not be eliminated by cultivation without applying the usual poison bran bait immediately after cultivation. If this is not done the cutworms will promptly concentrate all their feeding energies on the cultivated crop with disastrous results thereto.

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I. W. Helmsing. 1932.

PLATE 61.—THE BROWN CUTWORM (*Euxoa radians* Guen.).

Fig. 1 Eggs × 20.
Fig. 2 First instar × 8.
Fig. 3 Last instar × 1½.
Fig. 4 Pupa × 2.
Fig. 5 Adult Male, natural size.
Fig. 6 Adult Female, natural size.

Where it is necessary to protect a crop against cutworm attack, poison bran bait may be prepared and applied as follows:—Thoroughly mix 25 lb. of bran with 1 lb. of Paris green while still dry; then mix 1 quart of molasses in water. The molasses and water is then mixed with the bran and Paris green, the whole being well stirred up, enough water being used to obtain the desired consistency. Generally 2 gallons of water is required in the formula given, but only sufficient should be used to make a crumbly bait.

The poison bait is best applied in the late afternoon so that it is fresh and palatable when the cutworms come out to feed at night. The amount of bait to be used per acre will depend on several factors such as the intensity of the infestation, the nature of the crop to be protected, and whether the bait is to be broadcasted or applied in rows. A light broadcasting requires about 50 lb. dry weight of bran per acre, whereas if protection is to be afforded by sprinkling along the rows of plants to be protected 25 lb. dry weight of bran per acre may be adequate in crops in which the rows are 4½ feet apart. That means that in the latter case the amount of bait prepared according to the formula given in the preceding paragraph would be sufficient for one acre.

When treating plants in the row the bait should be placed under and near the plants, but not touching them.

The exact amount of bait to use in each case must of necessity be left to the discretion of the grower, and will be determined by the intensity of the attack and the economics of the particular crop to be protected. Circumstances may warrant the use of heavier applications than those already mentioned.

A word of warning must be issued with respect to the application of this control measure, and it is that proper precautions should be taken to ensure that domestic animals, such as poultry, cannot have access to the baited fields. Furthermore the bait must on no account contaminate plants, or portions of plants, to be used for consumption by man or animal.

Where cutworms are migrating from neighbouring areas much benefit may be derived from scattering the bait in front of the advancing cutworms, thus creating a poisoned barrier zone between the crop and the area whence the invasion is proceeding. Where the invasion has actually reached the marginal rows of the crop to be protected, the bait should be scattered in small heaps round the cultivated plants.

Protection is also sometimes afforded by ploughing a furrow a short distance in front of the line of advance of the cutworms and scattering bait in the bottom of the furrow. The steep side of the furrow should, of course, be next to the area to be protected and should thus face the advancing cutworms. The success of this control measure is dependent on suitable soil conditions and the formation of a well-drawn furrow. The side next to the area to be protected should be of loose crumbly soil. Should it become caked by rain it will be ineffective, and if the cutworms are still advancing it should be redrawn. The best procedure in applying this control measure is to open the furrow, throwing the loose earth towards the area the grower wishes to protect. The return furrow can then be cut into this, leaving a line of loose earth above a steep face. A second furrow is usually necessary to deal with the cutworms that succeed in crossing the first barrier.

Experiments with Baits for the Control of Certain Cotton Pests.

By D. O. ATHERTON, B.Sc., Assistant Entomologist.

ALTHOUGH several forms of baits have been used successfully for the determination of flight periods of certain species of moths, discouraging results have generally been the experience of those endeavouring to use baits as a means of controlling lepidopterous pests of crops. However, in spite of this unpropitious outlook, it was considered that the trial of baits was warranted as a control measure for lepidopterous pests of cotton—particularly for the corn ear worm (*Heliothis obsoleta* Fabr.). The prohibitive expense incurred by the direct application of insecticides in the case of a crop producing such a low return per acre as cotton does, and the comparative failure of the maize trap to protect cotton in a "late" season, contributed to the decision in favour of conducting baiting trials. By a "late" season is meant the delay in the arrival of the early spring rains, or their total failure, thus prohibiting the planting of cotton until the summer rains commence.

Baits.

It was decided that a bait liquid which would effectively attract virgin and gravid female corn ear worm moths should be the goal of these trials. As oviposition does not really begin until after the female has fed (Quaintance and Brues),[1] a bait resembling nectar would be expected to give the best results. Accordingly a nectar substitute was the main constituent in all the bait liquids used in the experiments under discussion, the substitute being either molasses or honey diluted with water. Fermentation in these syrups is too rapid under some conditions, but the addition of sodium salts has the effect of retarding this process and consequently prolonging the period during which they are attractive (Frost).[2] The addition of aromatic esters has also been known to increase the efficacy of baits (Eyer).[3] As a rule, death of moths attracted to baits depends on the fact that once they alight on the surface of the liquid, they are unable to rise owing to the operation of surface tension forces (Peterson),[4] but the addition of a stomach poison might be expected to help. The height at which the pail containing the bait is placed above the ground has a direct bearing on its efficacy when used against certain moths in fruit trees. This point was considered worthy of attention during the trials against the corn ear worm and other lepidopterous pests of cotton.

Pails.

Various types of bait pails, including enamel stew pans, tins 6 inches in diameter and 7 inches deep, and conical galvanised iron vessels 6 inches across the open end and 18 inches deep, have been used

with more or less success (Peterson),[4] (Eyer and Rhodes).[5] On the grounds of expediency the pails for these trials were made from 4-gallon kerosene or benzene tins—two pails from each tin. Each pail was stamped on the side at the level to which half a gallon of liquid reached when the bottom of the pail remained horizontal. All the pails were given a coat of paraffin wax on the inside in order that the corrosion of the tin should not interfere with the composition of the baits.

Experiment No. 1.

Two strips of land each one chain wide, containing 1 acre and under Durango cotton, separated by a strip of like dimensions under Rhodes grass, were used in this trial. Thirty-two pails were required for the various liquid baits, and the latter can be divided into four main groups—A, B, C, and D, of eight pails each.

A Group (*A*1 *to A*8).—The syrup was composed of molasses and water in the proportions of 1 to 7, and to four of the pails kerosene was added at the rate of fifteen drops per pail. This was done to determine whether evaporation could be retarded without sacrificing the efficacy of the bait.

B Group (*B*1 *to B*8).—In these the syrup was identical with that used for the previous group but, in addition, sodium arsenite was added at the rate of 0·5 oz. per gallon.

C Group (*C*1 *to C*8).—The syrup was composed of honey and water in the proportions of 1 to 7, but in four of the pails the water was that in which Quassia chips, at the rate of 1 lb. to 2 gallons, had previously been soaked for eighteen hours.

D Group (*D*1 *to D*8).—These pails contained water only, and were intended to serve the purpose of base controls from which to evaluate the efficacies of the baits.

In each of the three groups, A, B, and C, four of the pails were placed on the ground and four were on stands 2 feet from the ground. To some of the pails in each group either amyl acetate or ethyl acetate was added at the rate of fifteen drops per pail. Further details of the bait composition in each pail are given in Table I.

The experiment was continued for a period of five weeks from 26th January to 1st March inclusive. The eight pails of B group were attended for an additional week, because in these a considerable number of moths were taken each day at the conclusion of the five weeks' period.

Experiment No. 2.

Eight pails placed on the ground in half an acre of maize which was in silk were used in this trial. It was continued for four weeks almost concurrently with the other. When this trial was begun, the corn ear worm moths were ovipositing freely on the maize silks. The baits used were identical with some of those used in the first experiment, but the main object of this second trial was to determine whether the corn ear worm moth could be trapped in an area known to be densely populated by the gravid females.

Weather.

Fine hot weather was experienced for most of the time and, although there were four falls of rain, the total amounted to 18 points. Daily maximum temperatures ranged from 87·5° F. to 103° F., with an average of 96·3° F. The daily minimum temperatures ranged from 58·2 F. to 75·0° F., with an average of 66·1° F. The rate of evaporation was consistently high, varying from 0·30 inches to 0·47 inches per day. It was therefore necessary to add water to each pail every day in order to keep the concentration of the baits constant. In five weeks almost 150 gallons of water were evaporated from the thirty-two pails in the first experiment.

Collection of Data.

Every morning the numbers of moths found in each pail were recorded separately under three headings—viz., corn ear worm, green looper (*Antarchæa chionosticta* Turn.), and other species. Small moths with a wing expanse of much less than 1 inch were disregarded, as it was impossible to be certain that all of these in the molasses baits would be found each day. Therefore, although large numbers of the cotton leaf perforator (*Bucculatrix gossypii* Turn.) were often observed, no record of these numbers was kept, nor were they recorded in the numbers included as other species. The results of these daily observations are presented in Graph I. Throughout the whole of the period only two moths were taken in the D group pails of pure water; therefore these have been deleted from the records.

Experimental Results.

The results obtained from the second experiment refute none of the conclusions which may be drawn from the first, and for this reason they are given no further consideration.

The experiments were designed to ascertain the attraction, if any, of the various baits for the corn ear worm moth. But, although relatively few moths of this species were captured, numerous others were taken in the pails. They included green looper, brown cutworm (*Euxoa radians* Guen.), rough bollworm (*Earias huegeli* Rogen.), cotton leaf perforator, *Sericea spectans* Guen., and others. From this it will be seen that moths varying in size from those with a wing expanse of 4 inches, to small species measuring less than half an inch across the outspread wings, can be held with equal security when they are effectively attracted into the baits. Of the species other than the corn ear worm, the green looper is of the greatest economic importance, though the brown cutworm and the cotton leaf perforator may be of some importance in certain years. Very few adults of the rough bollworm were trapped, even though this species was well represented in the field. A glance at Graph I. will emphasise the low numbers of corn ear worm moths trapped compared with those of green looper and unspecified moths.

Out of a total of 4,141 moths of all species recorded from all the pails, only 159 were of the corn ear worm, whereas there were 2,131 green looper moths and 1,851 others—the latter unspecified but including brown cutworm, rough bollworm, and *Sericea spectans*.

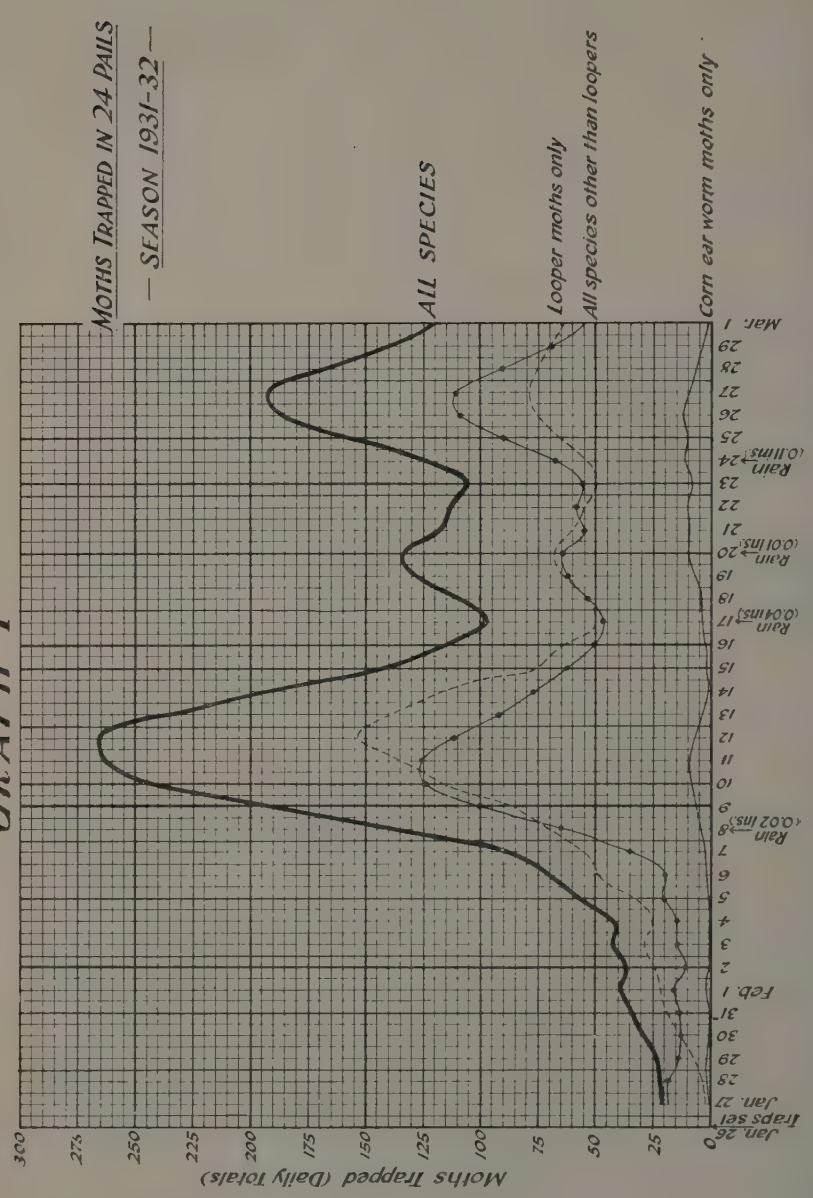
— GRAPH I —
MOTHS TRAPPED IN 24 PAILS
— SEASON 1931-32 —
ALL SPECIES
Looper moths only
All species other than loopers
Corn ear worm moths only
Moths Trapped (Daily Totals)
Traps set Jan. 26
Jan. 27
29
30
31
Feb. 1
2
3
4
5
6
7
Rain (0.02 ins.) 8
9
10
11
12
13
14
15
16
Rain (0.04 ins.) 17
18
19
Rain (0.01 ins.) 20
21
22
23
Rain (0.1 ins.) 24
25
26
27
28
29
Mar. 1
300
275
250
225
200
175
150
125
100
75
50
25
0

PLATE 62.

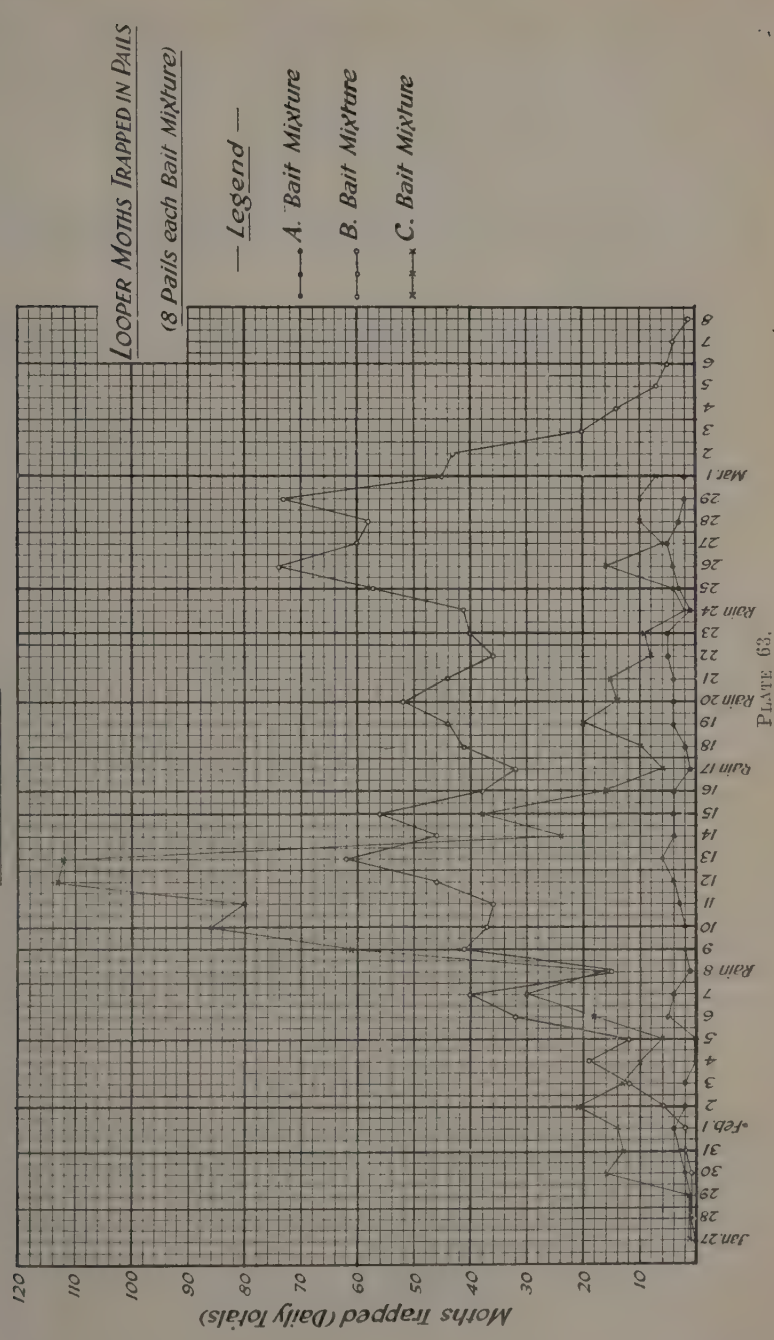
— GRAPH II —
LOOPER MOTHS TRAPPED IN PAILS
(8 Pails each Bait Mixture)
— Legend —
A. Bait Mixture
B. Bait Mixture
C. Bait Mixture
Moths Trapped (Daily Totals)
120
110
100
90
80
70
60
50
40
30
20
10
Jan 27
28
29
30
31
Feb. 1
2
3
4
5
6
7
Rain 8
9
10
11
12
13
14
15
16
Rain 17
18
19
Rain 20
21
22
23
Rain 24
25
26
27
28
29
Mar. 1
2
3
4
5
6
7
8

PLATE 63.

The baits of A group (molasses and water) were practically ineffective, as the eight pails in five weeks trapped only 16 corn ear worm moths, 100 green looper moths, and 208 others; those of B group (molasses, sodium arsenite and water) trapped 86 corn ear worm moths, 1,202 green looper moths, and 740 others; the C group (honey and water) trapped 57 corn ear worm moths, 829 green looper moths, and 903 others.

The total number of moths taken in pails on 2-foot stands was 2,176 compared with 1,965 in pails placed on the ground, but of the 2,131 loopers trapped, 963 were taken in pails on stands and 1,168 in pails on the ground.

The addition of kerosene to four of the A group pails resulted in a catch of 147 moths, 37 of which were loopers, compared with a total of 177 moths, 63 of which were loopers, in the four pails to which no kerosene was added.

The four C group pails containing aqueous extract of Quassia chips trapped 782 moths, 425 of which were loopers, compared with a total of 1,007 moths, 404 of which were loopers, trapped by the four pails in which the honey was diluted with pure water.

Of the twenty-four pails comprising groups A, B, and C, the six containing ethyl acetate trapped 1,088 moths, 665 of which were loopers, and the six containing amyl acetate trapped 773 moths, 367 of which were loopers. The comparative numbers—i.e., half totals, for the twelve pails to which neither acetate was added were 1,140 moths, of which 550 were loopers.

Both Graphs I. and II show that few moths were trapped until the baits had been out for almost two weeks. During the third week large numbers were taken in the C group pails, and only slightly fewer in those of B group. After the third week, however, the efficacy of the C group declined quickly, whereas that of the B group was maintained until the sixth week, when it declined very rapidly. Fermentation of the A group baits was rapid, and they were apparently not very attractive to the moths at any time during the five weeks. In the B group, which differed from the former in that the bait contained sodium arsenite, fermentation was retarded to a great extent, and these baits retained their attractiveness continuously from the second till the sixth week. Fermentation of the C group baits was fairly rapid, and they were very attractive during the third week, but during the fourth and fifth weeks they were little more effective than those of A group.

Discussion.

There are decided day to day and week to week fluctuations in the number of moths trapped by the various baits. Several contributory factors are postulated to account for these fluctuations; they include—

(1) Variations in the attractiveness of the baits owing to changes in composition such as would be caused by fermentation and growth of moulds, &c.

(2) Overlapping of generations, or any decided demarcation between the generations of the various species.

(3) Influence of light rains on the emergence of moths from pupæ in the soil.

(4) Climatic factors and their influence on the receptivity of moths to chemical stimuli.

Very little evidence either for or against these postulations was recorded at the time of the trials.

Under the conditions existing during this experiment, a syrup of molasses and water without the addition of a preservative fermented far too rapidly to be effective. A syrup of honey and water, on the other hand, was very effective for a short period, but was subsequently little better than molasses and water. The addition of sodium arsenite to a syrup of molasses and water so improved its qualities that the syrup was an effective bait for a period of three weeks at least, even under the high temperature conditions which prevailed. The three weeks during which this syrup was effective commenced at the beginning of the third week of the experiment.

Pails raised 2 feet from the ground on stands caught more moths than those on the ground, though the percentage of loopers included in the total catch was less. The use of Quassia chips in the preparation of the honey and water syrup depressed the total number of moths trapped, without materially affecting the number of loopers included. Amyl acetate decreased the total catch including loopers, whereas ethyl acetate did not greatly affect the total but increased the proportion of loopers.

Conclusions.

Under the conditions described, none of the baits used can be regarded as promising lures for the attraction of the corn ear worm moth. The small numbers trapped in the second experiment from a population known to be large, give no indication that baits can be successfully used in the control of the corn ear worm. A syrup composed of molasses and water and containing 0·5 oz. of sodium arsenite per gallon caught large numbers of looper moths over a period of nearly four weeks. This liquid bait may be worthy of further investigation should the looper assume greater importance as a pest of cotton in the future.

Summary.

Baiting trials were commenced with a view to obtaining a practicable method for the control of the corn ear worm on cotton.

The baits used included molasses and water, and honey and water syrups, with the addition of various other substances such as sodium arsenite, kerosene, aqueous extract of Quassia chips, amyl acetate, and ethyl acetate. Half the pails were placed on stands 2 feet from the ground and the remainder on the ground.

None of the baits used were effective against corn ear worm, but a syrup of molasses and water containing sodium arsenite at the rate of 0·5 oz. per gallon showed promise as a bait for the cotton looper moths.

REFERENCES.

1. U.S. Dept. of Agric., Bur. of Ento. Bull. 50, 1905.
2. Journal of Economic Entomology, XIX., 3, 1926.
3. Journal of Economic Entomology, XXIV., 5, 1931.
4. Journal of Economic Entomology, XVIII., 1, 1925.
5. Journal of Economic Entomology, XXIV., 3, 1931.

TABLE I.

MOTHS TRAPPED IN EXPERIMENT NO. 1.

INDIVIDUAL PAIL MODIFICATIONS.			MOTHS TRAAPED IN FIVE WEEKS.			
Pail.	Height.	Substances Added.	Corn Ear Worm.	Looper.	Others.	Total.
A1	Ground	..	3	16	16	35
A2	Ground	Amyl Acetate	4	12	37	53
A3	2 feet	..	1	21	27	50
A4	2 feet	Ethyl Acetate	1	14	25	39
A5	Ground	Kerosene	..	9	6	15
A6	Ground	Kerosene and Ethyl Acetate	1	8	13	22
A7	2 feet	Kerosene	1	9	40	50
A8	2 feet	Kerosene and Amyl Acetate	5	11	44	60
		Group A—Base of Molasses and Water	16	100	208	324
B1	Ground	..	17	222	137	376
B2	Ground	Amyl Acetate	3	131	41	175
B3	Ground	..	6	204	54	264
B4	Ground	Ethyl Acetate	6	182	44	232
B5	2 feet	..	26	129	205	360
B6	2 feet	Amyl Acetate	12	69	110	191
B7	2 feet	..	12	136	99	247
B8	2 feet	Ethyl Acetate	4	129	50	183
		Group B—Base as A + Sodium Arsenite	86	1,202	740	2,028
C1	Ground	..	15	109	142	266
C2	Ground	Amyl Acetate	4	30	57	91
C3	2 feet	..	10	102	202	314
C4	2 feet	Ethyl Acetate	7	163	166	336
C5	Ground	Quassia	..	76	84	160
C6	Ground	Quassia and Ethyl Acetate	4	169	103	276
C7	2 feet	Quassia	8	66	69	143
C8	2 feet	Quassia and Amyl Acetate	9	114	80	203
		Group C—Base of Honey and Water ..	57	829	903	1,789
		All Pails	159	2,131	1,851	4,141

THE JOURNAL APPRECIATED.

Chairman, Local Producers' Association, 26th August, 1933, writes:—"Enclosed please find 2s. for a renewal of your valuable journal for a further period of two years.

"I would like to say how extremely helpful the journal is to me, and is at all times a source of enlightenment on many subjects—a very real inspiration to men like myself who derive their existence from the land . . . hoping that every country home throughout the State will soon realise its need for a journal such as yours."

Seed-Harvesting Ants.*

By J. HAROLD-SMITH, M.Sc., N.B.A., Entomologist.

TOBACCO seedlings require favourable planting conditions if a uniform crop is to be established in the field; hence growers normally sow a greater seed-bed area than is theoretically necessary for the requirements of the land to be cropped. In spite of such an evident precaution, the losses in the seed-beds through various causes have frequently been so considerable that less than the desired acreage could be planted. Often the greater part of these losses has been due to the activities of several species of ants, some of which harvest the seed before germination while others nip off the seed leaves as soon as the plants appear through the ground. The species known to cause the second type of injury may also harvest the seed.

These seed-harvesting ants normally subsist on the available provender on the surface of the ground in forest country—weed and grass seeds being stored in the underground galleries of the nest for the communal food requirements of the insects. Most tobacco districts possess a rich ant fauna, and it is inevitable that when tobacco seed is broadcast over the specially prepared soil of the beds, the foraging workers immediately take advantage of the fact and industriously collect it for their own purposes. By filching the seed in this way, no seedlings appear in the beds after the usual germination period; or, should the numbers foraging be limited, an uneven strike of seedlings is the negligible result of all the efforts made in establishing and maintaining the seed-bed area. Some species, whose main colony is beyond the seed-beds, merely carry off the seeds, but others heap the seed near the openings of nests actually established in the seed-bed, and when these germinate the resulting seedlings are crowded etiolated specimens of no value to the grower. The actual loss of seedlings is perhaps of less importance than the implied disturbance in a planned programme for the planting of given acreages at a scheduled time, for failure to plant early in the year may involve a restriction in area while the success of late planted crops is somewhat uncertain.

The seed-harvesting habit is common to many native species of ants and several frequent seed-beds though not all are definitely known to remove the seed. Some are black and some are reddish-brown, but all are less than a quarter of an inch in length. The species implicated are *Monomorium* spp., *Pheidole longiceps* Mayr., *P. variabilis* Mayr., and a few unidentified forms. *Pheidole longiceps*, and possibly some of the others, may also destroy the germinated seedlings by nipping the first pair of seed-leaves from the plant. Many of these ants forage only during the cooler hours of the day; but one, *Pheidole longiceps*, seems to work continuously.

*Reprinted from "Tobacco Growing in Queensland," by N. A. R. Pollock, J. Harold Smith, and L. F. Mandelson. Published by the Department of Agriculture and Stock, 18th May, 1933.

Control.

Though various suggestions have been made for the control of these insects few have any experimental validity. Recent work by this Department has, however, shown that losses from seed-harvesting forms may be obviated by alterations in seed-bed management which entail little additional work. Ants in their foraging operations merely search the surface of the soil for food materials, though these are ultimately stored in underground galleries in the nest. In ordinary practice tobacco seed is sown on a compacted soil surface, a method which aims at procuring an even strike of plants. By top-dressing the beds after sowing with a sand cover to a depth of one-eighth of an inch, the seeds are protected from the ravages of harvesting ants. Such a covering does not interfere with the normal germination of the plants and may actually be culturally beneficial as the root system is better established before the seed leaves appear above ground. Medium-grade river sand is best suited for the purpose, and should be applied by hand at the rate of a kerosene tin and a-half (6 gallons) per 100 square feet of seed-bed. If sand is not procurable a top-dressing of light sandy soil may be substituted. There are various objections to the latter practice, chief among which are the possible caking characteristics of the soil and contamination with weed seeds and disease organisms. But when soil covers, as distinct from sand covers, have to be used, stocks should be drawn from virgin country which has not previously been cultivated.

On some farms where adequate germination has been obtained, the activities of leaf-cutting forms present a different problem. Normally the grower is better able to observe the activity of these, and while the measures already discussed should be regarded as a necessary part of seed-bed operations, the following, designed to cope with leaf-eating ants, may be adopted only where their depredations are evident. Fluid baits have been used a great deal but not with consistently good results, and better control has been secured by recognising the garnering habits of the insects and diverting them to other food materials. A suitable preparation is obtained by mixing Paris green and maizemeal at the rate of 1 in 50 with sufficient moisture to make a crumbly mash. No more water should be used than is necessary to ensure that the poison adheres to the carrier. The bait is broadcast over the beds as soon as leaf-harvesting species appear; 12 oz. of the mixture being sufficient to adequately cover 100 square feet of seed-bed. The beds may require protection for three weeks after germination, but by that time the plants are large enough to escape attack. In very acute cases it may be necessary to apply the bait every three or four days during this period, but ordinarily one, or at most two treatments, will give control. The bait apparently is preferred as food by the leaf-garnering species, and the seedlings are thus freed from their undesirable attentions.

If you like this issue of the Journal, kindly bring it under the notice of a neighbour who is not already a subscriber. To the man on the land it is free. All that he is asked to do is to complete the Order Form on another page and send it to the Under Secretary, Department of Agriculture and Stock, together with a shilling postal note, or its value in postage stamps, to cover postage for twelve months.

THE 1933 BRISBANE EXHIBITION.

PLATE 64.—ON THE OPENING DAY OF THE SHOW.

The gathering includes Their Excellencies Sir Leslie and Lady Wilson; the Premier (Hon. W. Forgan Smith) and Mrs. Forgan Smith; Hon. Josiah Francis, M.P.; Sir Donald and Lady Cameron; and the Lady Mayoress (Mrs. J. W. Greene).

PLATE 65.—A ROYAL CAVALCADE.
Aristocrats of the arena in the Grand Parade.

PLATE 66.

His Excellency the Governor, Sir Leslie Wilson (left), and the Premier, Hon. W. Forgan Smith, found much of common interest at the Brisbane Show.

PLATE 67.

The Minister for Agriculture and Stock, Hon. Frank W. Bulcock (left), and a friend reflect Queensland's cheerful spirit at the Brisbane Show.

PLATE 68.—IN THE DAIRY HALL.

Dairying in Queensland now ranks with Grazing as a great contributor to our export trade. A quarter of the aggregate butter output and almost half the cheese outturn of the Commonwealth are produced on Queensland's dairy farms. The annual value of the industry now approximates £7,000,000.

PLATE 69.—AN IMPRESSIVE PANEL IN THE DAIRY HALL.
In this Departmental Display the economic importance of the Dairy Industry was fitly illustrated.

PLATE 70.—IN THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

A "cereal story" told eloquently in sheaf and grain—a story of Departmental effort and success in breeding wheats suitable for Queensland's great grain lands in regions of summer rainfall.

PLATE 71.—CORN WAS KING IN THE DEPARTMENTAL COURT.

This fine maize trophy at the Brisbane Show told an impressive story of the development of maize-breeding and production in Queensland. It also demonstrated the success of Departmental plant-breeders in evolving and fixing types that have quadrupled our grain yield. Maize-growing is now one of Queensland's major agricultural industries.

PLATE 72.—EXHIBIT FROM THE STATE ANIMAL HEALTH STATION AT YEERONGPILLY, NEAR BRISBANE.

This section of the Agricultural Court was a centre of interest to graziers, dairy farmers, and other stockowners at the Brisbane Show. Many branches of veterinary research were illustrated. Queensland, however, is one of the healthiest stock countries in the world.

PLATE 73.—QUEENSLAND TOBACCO FOR AUSTRALIAN SMOKERS.

This panel was representative of every tobacco-producing district in the State. Queensland's tobacco lands produce high-quality leaf, acceptable alike to manufacturer and consumer.

PLATE 74.—THE TOBACCO ALCOVE IN THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

This exhibit arranged by the Entomological Branch showed how science is interlocked with agriculture.

PLATE 75.—A WHITE MAN'S INDUSTRY IN A WHITE MAN'S LAND.

In this corner of the Departmental Court was illustrated the remarkable technical progress of the Australian sugar industry—the greatest single agricultural enterprise in the Commonwealth.

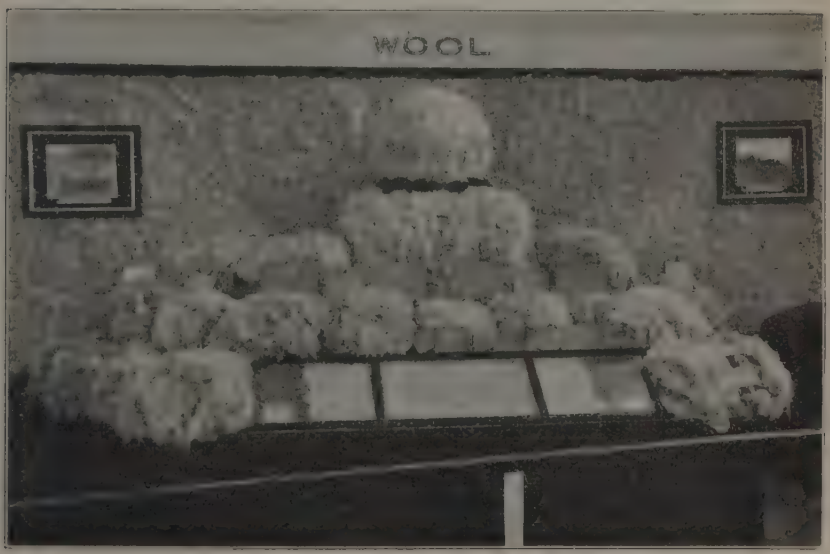

PLATE 76.—QUEENSLAND'S WEALTH IN WOOL.

Fleeces from Western flocks at the Brisbane Show, which coincided with a rise in wool prices—a bright augury of a return to pastoral prosperity.

PLATE 77.—DISPLAY BY THE COTTON BRANCH.

Cotton-growing is now well established in this State, and Queensland lint feeds Australian looms. The spinning industry is now an important factor in the economy of the Commonwealth.

PLATE 78.—THE JOURNAL AT THE SHOW.

The "Queensland Agricultural Journal" Bureau was the distributing centre of information on the activities of the Department of Agriculture and Stock—a service much appreciated by farmers visiting the Show. Mr. Eric Keehn is the young officer in charge.

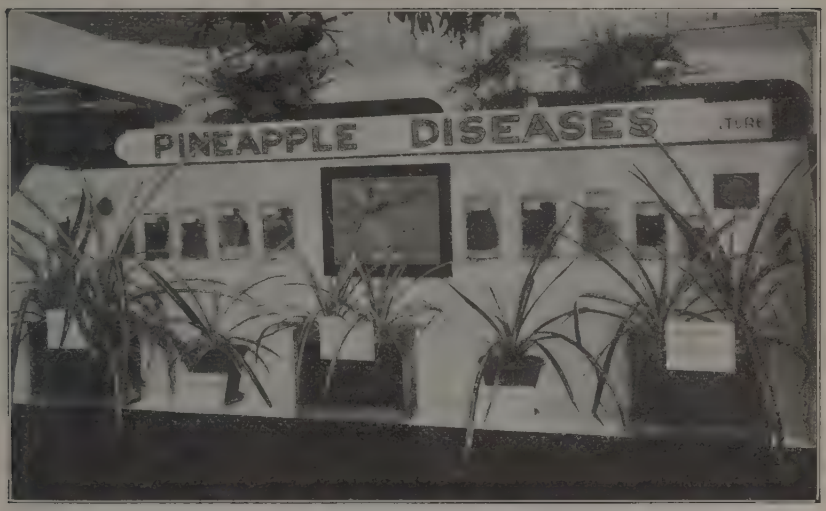

PLATE 79.—SCIENCE ALLIED TO RURAL INDUSTRY.

This and other exhibits of the Entomological Branch and its Pathological Section was illustrative of the extent and value of the scientific services available to Queensland farmers.

PLATE 80.—THE PEANUT TROPHY.

Peanut-growing is now a well-established industry in the South Burnett district and Central Queensland, and is mounting up rapidly in annual value to the State.

PLATE 81.—THE FARMERS' FEATHERED FRIENDS.

Native birds as pest-destroyers have now been given a definite place in Australian rural economy.

PLATE 82.—THE POULTRY PANEL IN THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Poultry-raising is a thriving industry in Queensland, and is progressing steadily in annual value. The egg export trade is also developing well; 1,300,000 dozen Queensland eggs were marketed in Great Britain last season.

Plate 83.—Panelled Pastures in the Departmental Court.

Probably 80 per cent. of Queensland's rural wealth is derived from rich indigenous and introduced grasses, and this exhibit illustrated their wide range and nutritive value.

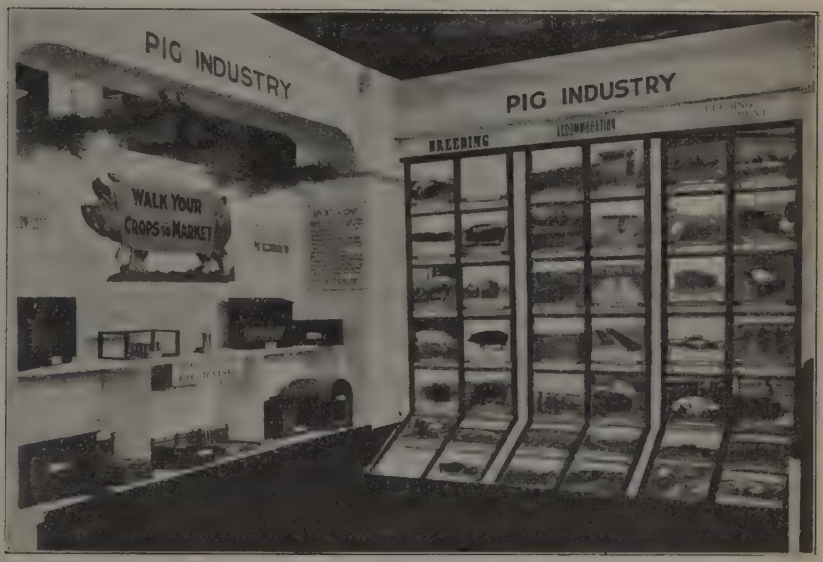

Plate 84.—A Corner of "The Piggery," Departmental Court.

Pig-raising is a well-established and rapidly-expanding Queensland industry. Throughout the year an active educational campaign is carried on, and this display illustrated the effectiveness of that work.

THE DAIRY INDUSTRY.

SOME COMMON DISEASES OF STOCK.

(Dairy Branch.)

IT was intended to follow up last month's article with one on feeds and feeding, but owing to the large number of queries received about diseases in cattle these notes on the economic importance of several contagious diseases have been substituted.

The diseases dealt with are responsible for enormous wastage in the primary wealth of Queensland, and this loss is borne solely by the primary producer. Much can be done by the dairy farmer to avoid this loss. It is simply a matter of knowing the cause and the remedy and taking suitable action along the lines recommended. In ordinary circumstances, each disease would justify a separate article, but owing to the necessity for early action a brief reference is made to the four major stock disorders occurring in this State. They are—Tuberculosis, Contagious Mammitis, Contagious Abortion, and Contagious Vaginitis.

Tuberculosis.

This disease is caused by a specific germ and is transmitted from cow to cow through excretions such as coughed-up sputum, saliva, urine, and dung. Dung from infected cows infect pastures, and germs are thus taken in by animals grazing over such areas. Bails may be similarly infected, and the germs inhaled with dust in the atmosphere.

The economic importance of tuberculosis is obvious. Owing to the chronic nature of the disease the animal becomes unthrifty, and over a period of years will show a gradually diminishing return for the same expense incurred in feeding and labour. Finally the animal dies, or has to be destroyed. Destruction represents a direct loss, plus the unfavourable balance-sheet of the cow over a period of years.

The contagious nature of the disease renders the presence of a tuberculous animal in the herd a constant source of danger; the unfavourable balance-sheet of one cow may become that of several cows and finally the whole herd.

It must be remembered that infected milk from a tuberculous animal is going to produce the disease in young stock and pigs fed with such milk.

There is no known cure for tuberculosis, so activities must be directed towards the elimination of all infected animals from the herd. It is not possible to definitely diagnose tuberculosis from the external appearance of the animal, though any beasts noticed to be coughing, showing swollen glands, or are more unthrifty than the rest of the herd should be regarded as suspicious cases. Positive diagnosis is made by means of the tuberculin test, and any farmer suspecting the presence of the disease should communicate with the Department of Agriculture to arrange for tests to be carried out.

All tuberculous animals should be culled from the herd.

Contagious Mammitis.

Contagious mammitis is caused by a specific germ, but infection is often complicated by the presence of more than one strain of organism. In most cases, infection occurs through the germs gaining access to the udder by way of the teat canal, and is transmitted from cow to cow by machines, and milkers' hands that have come in contact with infective milk. According to the type of mammitis present, so is the economic aspect of the outbreak likely to vary. In a case of sudden onset within a few days of calving (udder hot and swollen, milk curdled and discoloured, lameness, loss of appetite), associated with infection of the womb, the case is likely to end fatally within anything up to four weeks. In any case, the affected quarter or quarters never function again. Thus it will be seen that such an attack is likely to result in the loss of the beast and at least a permanent reduction of return from that cow, though production costs remain unaltered.

Other cases of mammitis are likely to develop at any time during the lactation period; they vary from acute to chronic cases, depending on the treatment adopted. A cow may be affected suddenly, showing similar symptoms to the previous type, but without the complication of womb infection. This type results in a marked decrease of milk production for at least one lactation period, and if proper treatment is not adopted the case will become chronic. As a result, the milk secreting tissue of the udder is replaced by hard fibrous tissue, and the animal finally becomes useless as a production unit.

Production recording figures for 1932 show that the average return per cow for the year was £10 6s. 3d., so depending on the extent of infection, corresponding fractions of that amount will be lost for every cow affected with mammitis. Obviously the better the type of cow affected, so will the loss increase. If the disease is to be kept under control, the farmer must be thorough in treatment—any half-hearted measures will not yield favourable results. Treatment may be considered under the heading of Individual and General.

Individual Treatment.

Dealing with those cases immediately following calving, individual treatment must be directed largely towards the womb. The use of iodoform pessaries gives excellent results. Hot fomentations applied to the udder to reduce pain and swelling, and judicious use of autogenous vaccine, if it can be secured in time, will prevent the spread to other quarters. Though complete recovery cannot be hoped for, still the life of the animal can be saved and destruction of the udder tissue kept down to a minimum.

Ordinary acute cases not associated with calving respond well to treatment and may result in complete recovery, and it is with such cases that the farmer will be fully repaid for all his efforts to combat the disease.

When the condition is noticed, give a good laxative drench followed by a restricted ration. Hot fomentations will reduce pain and swelling and massage of the udder, combined with two-hourly milking out of all quarters, will prevent hardening of the udder and will cause clots and discoloration to disappear from the milk. The judicious use of autogenous vaccines is of great value in bringing about this recovery.

Without thorough treatment these cases will develop into the common chronic conditions in which extensive hardening of the udder is present. These advanced cases rarely respond to treatment, and the best place for animals so affected is the butcher's yard.

General Treatment.

All the treatment described, including vaccines, is so much waste of time and money if proper attention is not paid to general hygiene and the management of affected cattle.

Milk all affected cows last to prevent the spread of the disease to clean cows by machines or milkers' hands. Do not transfer a seemingly cured case to the clean portion of the herd until a microscopic examination of milk samples has proved the animal to be non-infectious.

Infective milk must be disposed of in such a way that it cannot infect bails, utensils, leg-ropes, or any other article of plant or equipment. Do not simply strip out on to the floor; such a practice is dangerous. Keep machines and utensils thoroughly clean, paying particular attention to any article that has come in contact with contaminated milk. Machines properly cared for will not cause mammitis, but the farmer who neglects this will quickly find himself with contagious mammitis widespread throughout his herd.

Vaccines.

Contagious mammitis vaccine may be secured from the Animal Health Station, Yeerongpilly.

Scale of Charges.

No. of Animals.	Charge. s.	d.
1	2	6
5	6	3
10	10	0
20	16	8
25	20	0
40	30	0
60	40	0
80	46	8
100	50	0

There are two classes of vaccine, although both are prepared in exactly the same way, the difference being that the *autogenous vaccine* is definitely prepared from the particular strain of germ affecting the animals it is proposed to treat. To prepare such a vaccine, a small sample of the strippings from the affected quarter of the cow must be sent to the Animal Health Station. This should be forwarded in a clean bottle, without preservative.

If the vaccine prepared in this way were sold for use in another herd it would be classified as a *stock vaccine*, or, in other words, one that is kept in stock or on hand.

Either may be secured from the Animal Health Station at the foregoing rates. A few days are required to prepare the autogenous vaccine which will remain potent for about six months.

The vaccine is injected into the loose subcutaneous tissue behind the shoulder in the same way as tick fever innoculation is performed, and the ordinary 10 c.c. tick fever innoculation syringe and needle are necessary for the operation.

Full instructions are supplied from the Animal Health Station.

Contagious Abortion.

This is another disease caused by a specific germ and rendered more important by reason of its contagious nature.

Clean cattle become infected by grazing on pastures that have been contaminated by the ordinary discharges and after-birth of affected cows. Occasionally the disease is transmitted by a bull serving a cow showing infective discharges, and then serving a healthy cow.

It is not difficult to realise that contagious abortion in a dairy herd can be responsible for large losses. In the first place, when a cow aborts, the farmer loses what may normally have been a valuable calf, and the infected cow is idle over a period which should have been productive. Again, contagious abortion is definitely connected with temporary and permanent sterility, often being the cause of that aggravating "return to the bull."

When a cow is affected with the disease there is a great likelihood that she will not clean properly, resulting in serious inflammation of the womb, which may even lead to the death of the animal.

Considering the losses likely to be suffered, and the fact that if affected animals are not culled from the herd contagious abortion will continue to worry the farmer every year, it is obvious that the disease is one that cannot be lightly considered.

There is no known cure for contagious abortion and preventative or curative innoculation is valueless, and even dangerous in a country where it is possible to eliminate the disease.

In the control of contagious abortion care must be exercised in the destruction of all infected discharges, after-birth, and aborted calf. Thoroughly wash all parts of the cow stained with discharges, using a disinfectant solution. After-birth and the aborted calf must be collected and burnt. Any fodder, &c., noticed to be contaminated by discharges should be similarly dealt with. Elimination of affected cows from the herd is the most certain way to control the disease.

Definite diagnosis is obtained by the testing of blood samples from infected cows. This blood test is carried out by the Department. Sometimes abortion occurs at such an early date in the development of the calf, that its occurrence may not be noticed. When a cow that is supposed to be in calf shows a sudden return of "heat" periods, the farmer should suspect that abortion has occurred, and it is advisable to arrange for the testing of such cows.

A cow infected with contagious abortion may slip one calf and then carry all subsequent calves to full time and calve normally. This explains the many claims often made for various "cures" of the disease. Such cows are a menace because, though unsuspected, they are capable of spreading the disease as the discharges and after-birth are infective, even though calving is normal. Considering this point, it is advisable to have all stock tested before introduction into a clean herd.

Contagious Vaginitis.

Contagious vaginitis is caused by infection of the vagina, with various strains of organisms. The spread of the disease is to a large extent brought about by the bull serving an affected cow, and then a clean one. Careless handling and examinations of the vagina are a big factor in original infection and spread of the disease.

The economic importance of contagious vaginitis is in its being a cause of temporary sterility of dairy cattle; the general health of the cow is rarely affected.

The continued return of the cow to the bull is responsible for greater loss to the farmer than is at first apparent. Take the case of a cow that requires three visits to the bull before she becomes pregnant. This means that she will be idle for six weeks longer than normally, actually a loss of the amount that cow would

return in six weeks. Consider the fact that several cows may be so affected, some requiring more than three services, others remaining permanently sterile, and it is not difficult to realise that contagious vaginitis is responsible for many reduced monthly cheques.

Diagnosis of the condition is not difficult. Thick, tenacious, glassy, discharge will be noticed coming away from the cow; this usually clears up in a day of two; then on opening the lips of the vulva it will be seen that the membrane of the vagina is studded with tiny nodules, varying from reddish to a yellowish grey colour. These exist for a variable time, days to months, after the discharge has ceased.

Treatment consists of douching the affected cow three times weekly with a solution of Condy's Crystals, using one gallon of water and sufficient Condy's to produce a violet colour. About half an hour before the cow is put to the bull irrigate the vagina with a 1 per cent. solution of bi-carbonate of soda—a heaped dessert-spoonful to a quart of water.

It must be remembered that the bull is likely to contract infection, and periodical inspection of the sheath and penis should be made.

In control of the disease care must be taken that in any examination of cows, the hand and arm are thoroughly disinfected, and any instruments must be disinfected after use on one cow, and before proceeding to examine the next.

Nutrition is a factor that must be considered in treatment and control of disease. If a properly balanced ration is not fed to the herd there is little chance of thoroughly eliminating any of the diseases described. Therefore, pay every attention to correct feeding, when formulating a plan for disease eradication.

A worth-while slogan for the farmer to remember is

"Breed, Feed, and Weed."

IS PRODUCTION RECORDING WORTH WHILE?

WHEN one considers that last year only 300 dairy farmers out of approximately 25,000 took advantage of the free facilities offered by the Department in the testing of their herds for production, it is plain that there is some reason for the neglect of the others to take advantage of the scheme. It is also apparent that there are only two reasons which can be advanced—namely, that they either did not know of the scheme, or that they did not consider it worth while to test.

Now, there are very few who will confess the former, for it has been broadcast for years and years, leaving little doubt that at least 90 per cent. of dairy farmers have known about it. It is, therefore, conclusive that most of them consider it to be not worth while. Has the matter been really seriously considered?

The Object of the Practice.

The whole object of production recording is to determine the low producing animals in a herd with a view to culling them, and likewise to find out the high producers from which to breed.

Let us go through these phases systematically, and we find that they represent the beginning and the end of dairy farming.

Dairy farming is not a matter of milking cows, separating the milk, forwarding the cream to the factory and the separated milk to the pigs. It is an occupation that calls for intelligence of a high order to command success, and the return is commensurate with the amount of intelligence displayed in the conduct of the business, just as in the commercial world. Think over that statement. It is not inferred that a college education is necessary, for the power of thought is within the reach of all; and in this State we have assuredly as high an order of intelligence among our primary producers as may be found anywhere else in the world.

Successful Dairying Connotes Keen Business Faculties.

Dairy farm practice quite definitely involves keen business management, and we shall take stock of the position from that angle.

Consider your investment! What did your farm cost, or what is it worth? Say, £5 an acre without your buildings. Let us estimate your safe carrying capacity as 3 acres to the beast, which represents £15 worth of land for each animal. How many lots of £15 are lying idle and producing nothing, or how many cows have you on agistment? Do not answer "none," because if you have never tested you do not know how many are eating your grass and giving you only 1s. a week for the privilege, to say nothing of the additional half hour's work a day in yarding and milking them. You are probably good enough also to give them two good meals a day, which took you some time to prepare. We would recommend that you test to find out how many of these "boarders" you really have. There is no other reliable method, for you cannot determine the quantity of fat in the milk without the Babcock tester. To estimate only the quantity of milk produced is futile, for there is likely to be a considerable variation in the fat content. It has been demonstrated over and over again by herd recorders that what was thought to be one of the best producers was in reality an inferior producer of fat. Your best milk-producing cow may have a very short lactation, whereas your other animals may have the capacity to carry through a full nine months' period. Without keeping records these facts cannot well be remembered.

This leads us directly on to the matter of producing characteristics, but in order to make our points thoroughly clear we would like to broadly review breeding principles for the benefit of those who have not made a study of the question.

Points in Breeding.

The whole principle of breeding is based on the Mendelian theory that like begets like. Now this must not be considered to be without exception, for the facts concerning reproduction show clearly the possibilities of variation.

It may probably be best explained in this way: The calf is developed by the union of a male cell with a female cell, both of which contain the characteristics of the parents. Thus each joint cell, or the embryo calf, contains two sets of characteristics, one from each parent. It is obvious that the progeny, however, can show *only* one characteristic in each direction, whether it be in the shape of a part of the body, the functioning of an organ, or a quality. All of these characteristics which are noticeable are termed "dominant," while the other corresponding characteristics which are hidden are termed "recessive." In the next generation it may happen that some of these "recessive" or hidden characteristics become "dominant," and thus we find what are termed "throwbacks." By exercising care in the selection of parents, however, it is possible to ensure the transmission of desirable characteristics to the offspring to a remarkable degree, as the young calf can show only the characteristics it inherits either through its parents or grandparents.

Take, for instance, the quality of milk production. If the dam and grand dam had this quality highly developed and the sire also inherted this quality the progeny can inherit only the same characteristic. Thus it is necessary to mate only the best producing cows in the herd with a bull from a similarly good production strain, if it is desired to build up a herd of good producing females.

You will also have observed from the foregoing that the bull is without doubt half the herd, for his set of characteristics is transmitted to each of the progeny. The better producing quality the bull inherits, the better will this characteristic be in his offspring—provided, of course, that the constitution is sound. This subject of breeding is a big one, and it shall be dealt with more fully in future notes, which will explain how to effectively ensure the transmission of desirable qualities from a generation to subsequent generations.

"Star Boarders" a Hindrance.

In the meantime, let us return to the cows we have on agistment. We can see clearly that these star boarders are a hindrance. They have to be fed for no return; they take up the room of a good cow which would help to keep you, while even their progeny, no matter how good the bull, are sure to be 50 per cent. duffers. They merely transmit their non-producing characteristics. The characteristic which we wish to transmit is the ability to produce well for at least nine months. We do not want an animal that dries off after six months. That is the characteristic of beef breeds.

If the influence of feeding is not mentioned at this stage, it will result in no end of discussion. We must admit quite definitely that a cow will not milk to her inherited capacity unless she is properly fed and nourished, but it should be noted

most clearly that no matter how well you feed one of these star boarders she will never produce her keep in butter-fat. It should also be remembered that during the summer we have generally an abundant supply of the cheapest of fodders available—pasture grasses. Have your cows inherited the ability to make the most of this fodder, or have they inherited the ability to produce only enough to rear a calf, no matter how plentiful and luscious the pasture?

There is only one way to tell, and that is to keep records. Without records we are working in the dark. Without exercising ordinary business methods, we are working haphazardly and cannot place our finger on our leakages.

We must eliminate these non-productive units if we do not wish them to starve us out.

With the prevailing low prices overseas for our dairy produce, and the likelihood of their remaining at a lower level than that experienced during the post-war years, it is essential that we take stock of the position. We must increase the productive capacity of each unit in the herd, and so enable us to show a margin of profit from each cow in the bail.

We have heard much about over-production, but that will be dealt with in further notes on marketing. Suffice it to say at this juncture that much was made of the matter at a period of extraordinary production throughout the dairying countries, which unfortunately coincided with an acute period of under-consumption due to a world-wide financial depression.

There does not appear to be any outlook, however, for the dairy farmer who is content to keep cows for the price of an agistment fee.

HERD RECORDING—A FREE SERVICE.

The herd recording scheme of the Department of Agriculture and Stock is a service absolutely free of cost. The Department defrays all costs, including the railage on bottles; so that the dairy farmer has not even to pay one penny. Recently the Department approached the butter factories in various parts of the State and secured their whole-hearted co-operation in carrying out this work. In many centres the actual testing is carried out by the factory, the results being posted to the Department so that a production chart may be issued at the end of the lactation of each animal. No dairy farmer can afford to neglect to record, if he desires to make a success of his business. Every State or country in the world charges varying sums up to 6s. per cow for the service, which is readily availed of by all progressive dairymen. In Queensland this service is free to the dairy farmer.

Herd recording will determine the respective value of each animal in the herd. This information will enable the dairymen to—

1. Cull out the unprofitable animal.
2. Reserve the females from the high producing animals for replacements in his herd.
3. Determine the blood lines of the sire that will beget daughters whose production figures will exceed those of their dams.

The butter-fat producing power of the cow should be inquired into, just as the horse power of your farm engine. Such knowledge increases efficiency. To take advantage of the scheme during the coming season, just hand your name in to the dairy leader of your local producers' association, and arrangements for recording your herd will be promptly made.

SEED MAIZE SOLD.

Maizegrowers are advised that stocks of all varieties of seed maize as advertised for sale from the Department of Agriculture and Stock, Brisbane, in the July and August issues of this Journal, have been sold out.

The Department has had to meet an exceptionally heavy demand for seed maize following on the winter rains and the display of stud seed maize in the Department's Court at the recent Brisbane Exhibition.

THE CALF—CARE AND TREATMENT IN HEALTH AND DISEASE.

By J. A. RUDD, L.V.Sc., Department of Agriculture and Stock.

IT is not possible to treat this subject as exhaustively as it should be dealt with in this treatise, as the subject is too wide to be dismissed with the few observations that are herein contained, but the following will assist those interested in the rearing of calves to assist themselves.

Perhaps few young animals are subjected to greater vicissitudes during their early lives than the progeny of the modern dairy cow during the first few months of its existence. Generally, the calf no sooner sees the light of day than he is either bereft of all maternal care by being forcibly removed from his mother, or he is unscrupulously knocked on the head as being useless and unwanted, he having served the purpose of the average dairyman, in that his birth was to a large extent responsible for his dam freshening for another season. But if he is kept alive this to a large extent depends on the average dairyman's estimate of his mother, which is generally faulty, inasmuch as she is seldom judged by her record of butter-fat, but chiefly by the quantity of milk she yields and her general condition at the end of a very bad season. If the calf has been born in a back paddock he may chance to have his dam's fostering care for a few days, and if the calf succeeds in hiding he may continue to have a few more days with his dam, but this may terminate very abruptly, for his mother may be removed and the infant calf left to starve and die without maternal protection.

The above is only one side of a picture, as it depicts the healthy calf born of average healthy parents fortunate to be free of transmissible disease.

The other side depends largely on the health of both parents, and no matter how much care is at times bestowed on such offspring, if they survive the first few months of their lives, at the best they are miserable specimens of their particular breeds, even if they reach maturity. This is a provision of nature in order to maintain a healthy virile race of cattle, and amounts to survival of the fittest.

Under this category may be placed calves born of parents affected with the following:—

Contagious abortion.
Contagious vaginitis.
Tuberculosis.
General lack of virility due in part to (*a*) unclean condition of the uterus at the time of conception; (*b*) weakness, either hereditary or acquired on the part of either or both parents at the time of conception.

Contagious Abortion.—Full-time calves born of parents which have established a relative immunity to contagious abortion are generally born either with white scours or septic pneumonia of calves. White scour under these conditions is difficult to treat, and if curable and the animal survives to reach maturity is, in my experience extending over some years, at the best a fitful breeder and can never be depended on in this way at any time during its active life when it is generally supposed that the animal should have no trouble in reproducing its species. The cause cannot be explained. Calves which are affected with septic pneumonia seldom survive the disease and generally succumb in spite of all care and attention. This, of course, does not always apply to calves born of relatively immune parents and fed on milk of cows which are not contagious aborters, but applies even then as exceptions in the main.

Contagious Vaginitis.—Calves born of such parents may be weaklings at birth, and as such are predisposed from the inception, but this does not always hold true; but as a general rule they are subject to most ailments, and succumb before they are three months old.

Tuberculosis.—Calves born of such parents can be quite healthy, and if removed at birth or soon after and not fed on the milk of their parents after the first few days do well; but there are examples of animals not being quite up to the mark at times, particularly when either or both parents are affected with generalised tuberculosis commonly called galloping consumption in human beings.

General lack of virility due in part to unclean conditions—

(*a*) Of the uterus at the time of conception;

(*b*) Weakness inherited or acquired on the part of one parent or both at the time of conception.

General lack of virility.—This may be due to lack of phosphates in the soil on which the cattle were being depastured at the time the calf was carried in utero. This causes a lack of nerve tone in a flaccid uterus, and the retention of placenta or cleanings follows, and if this placenta is not completely removed and the uterus cleansed or only part cleaned the succeeding calf, if the cow does conceive, cannot be a healthy calf, as the uterus or calf bed was not quite clean at the time of conception; but this does not always follow, and in every well-defined case there are always exceptions which, in a good measure, prove the rule.

In order to remove the placenta, give the following drench:—

Epsom salts	12 ounces
Carbonate of ammonia	1 ounce
Powdered gentian	1 ounce
Powdered ginger	1 ounce
Treacle	1 lb.
Water	1 gallon

Drench after a twelve hours' fast.

After placenta has come away flush the uterus for seven days with 20 grains of permanganate of potash to 1 gallon of water.

Flush with gravitation and not with a force pump, and always wait for twenty-four hours after the placenta has been voided before flushing.

Weakness inherited or acquired on the part of one parent, or both, at the time of conception.—Inherited weakness has already been dealt with. Acquired weakness is due partly to the hard, unnatural conditions under which both parents have at times to struggle. The intensity of this varies, and is in direct ratio with the ability of the owner to withstand the effects of a devastating drought. A first-class dairy cow is always in profit, whether she is milking or not. This fact is often lost sight of, with dire results to both parent and offspring. The bull is often turned out with the herd, and before the season has closed he has lost a good deal of his virility, and with it his prepotency, and his ability to produce virile offspring is in direct ratio to the method by which he was treated during the season. The dairy bull should not run with the cows, but he should be enclosed within a strong bull paddock and the cows turned into him for one jump when in season.

The foregoing deals chiefly with methods of prevention, which are more important than the curing of the sick and indigent. Prevention of disease should be the motto of every dairy farmer. The curing of the sick, although helpful, is not a very profitable form of occupation, as a certain amount of intense training is necessary before this can be successfully accomplished by the ordinary man on the land, who has little time at his disposal for this particular form of diversion, but who can prevent almost all his troubles by being trained to recognise certain well-established rules in dairy hygiene. Assuming, however, that a calf is born healthy of average healthy parents, he should go through life without a hitch, but, unfortunately, through faulty methods of treatment and feeding, he is predisposed to diseases which are only contagious when everything is favourable to their development. The ordinary healthy calf should run at least four days with his mother, after birth, and this holds good for both dam and offspring. Both have been so intimately connected for nine months that it is harmful for both to make a sudden and rapid separation, for which there is no necessity. The sucking of the calf contracts the calf bed or womb rapidly, in forty-eight hours, and at the same time enables the calf to develop from his mother's milk in his own system, which assists him to fight all diseases for at least six weeks of his life. Removal from the dam after the age of four days should be followed by being starved from twenty-four to thirty-six hours, and fed on his dam's fresh milk for fourteen days thereafter. Half whole milk and half separated skim milk for another fourteen days, and during the fourth week the addition of one tablespoonful of raw linseed oil to every three quarts of half-and-half mixture, which should be six quarts daily divided into two feeds. At the end of the month he could have three quarts of skim milk in the morning and three quarts of skim milk at night, with one dessertspoonful of raw linseed oil night and morning until he is two months old, when he gets, in addition, one dessertspoonful of finely-ground maize meal to every three quarts of skim milk, and he also picks up a little grass and looks for clean, wholesome water, which should be drawn from a well, spring, or creek of running water. Water from a dam which drains the whole paddock is a positive menace to the health of the young calf, and is probably the source of parasitic invasion. Assuming, after all this care and attention, a calf becomes infected with disease—look for the cause. Do they suck each other after feeding? Blind teats in newly-calved heifers and impotent young bulls have been caused by this grave fault. The remedy is prevention, and the only method which

is truly effective is to build bails so that each little calf will have his own bail for feeding and his own half-kerosene tin container for his milk. Twenty bails will feed 60 calves more easily and quickly than slip-shod methods of single-hand bucket or tub feeding. Twelve bails will also serve the same purpose. In spite of all these precautions, a calf might become out of sorts and, gradually growing worse, diarrhœa, blood scours and white scours develop. Isolate the calf and give him one or two tablespoonfuls of crude castor oil according to size and age, and starve him for twenty-four hours with ample water beside him, and keep him tied up under cover, with a good bed to lie on.

Second twenty-four hours: Feed him on boiled barley water, three quarts after having administered one teaspoonful of paregoric in two tablespoonfuls of water.

Third twenty-four hours: One teaspoonful of paregoric in a tablespoonful of water and six quarts of barley and fresh, new milk half-and-half for the day.

Fourth twenty-four hours: One teaspoonful of paregoric as on the previous day and six quarts of barley water and new milk half-and-half.

Fifth twenty-four hours: Skim separated milk and new milk half-and-half.

Sixth twenty-four hours: Six quarts of skim milk, new milk equal parts for the day with one teaspoonful of raw linseed oil mixed with one teaspoonful of lime water.

Seventh twenty-four hours: Six quarts of skim separator milk and one dessertspoonful of raw linseed oil and a dessertspoonful of lime water divided into two feeds for the whole day. Lime water to be made as follows:—

Place 2 or 3 lb. of slaked lime in a kerosene tin and fill up with rain water. Stir well and allow it to settle. After allowing twenty-four hours for this solution to settle, pour off the lime water, taking care not to disturb the precipitated lime at the bottom of the tin. Equal parts of lime water and raw linseed oil stirred up and agitated will make an emulsion which will be very useful for feeding calves.

Do not bring neighbours' calves into your mob, even if you get them as a present, as, although your calves can resist existing strains of disease in your own herd, because their systems have built up against them, they cannot resist existing strains in your neighbour's herd for which they have not built up anti-bodies.

Do not turn your calves out into the same paddock with the dairy cows. Do not turn them out into a back paddock for weaning, as it gives them a bad start in life. They should not leave the home paddock in which they have been running whilst they were on the bucket until they are at least nine months old.

STABILISATION OF BUTTER PRICES.

IN the course of a recent Press statement, the Minister for Agriculture and Stock (Hon. Frank W. Bulcock) said: "My attention has been drawn to a statement made by the Minister for Commerce (Mr. F. H. Stewart) in which he accuses me of having said that the Federal Government have been inactive in the stabilisation of butter prices. Quite obviously, my reply to a question directed to me in the House by Mr. E. B. Maher, M.L.A., has been mutilated in the Sydney Press. What I did say, as reported in 'Hansard,' was that enabling legislation depends upon the attitude of the Commonwealth Government. This, in effect, means that while the various States of the Commonwealth may be willing to pass legislation, such legislation would not be operative until sanctioned by the Commonwealth Government. As far as Queenslaid is concerned, our legislation is ready, and certain of the other States have also prepared legislation. At the present moment there is a suggestion that the several Ministers concerned meet in conference to discover the common basis that is desirable, and that viewpoint was expressed by Mr. Stewart when I met him in Brisbane recently. It is true that the Commonwealth Government either refuses to pass legislation or agrees to pass it, and to that extent the Commonwealth Government control the situation, as no State can act independently of the Commonwealth. At the present juncture, considering that certain States have not yet adopted the principles of butter stabilisation, it would be unfair to suggest that the Commonwealth Government is causing delay. I rather imagine that Mr. Stewart's remarks should be directed towards my questioner (Mr. Maher), who, by way of interrogation, suggested that failure to stabilise butter until the last minute reposed on the Legislature."

A TALK TO SHEEP FARMERS.

J. L. HODGE, Instructor in Sheep and Wool.*

THE Department of Agriculture and Stock is at all times ready and willing to help the man on the land with his problems. We feel that these activities are not generally known, and, where known, are not sufficiently made use of. No matter what the problem is, a specialist is ready to cope with it. We welcome correspondence on any subject appertaining to the land or stock and, in addition, where possible, and if considered sufficiently important, an officer is detailed to make a personal inspection.

As far as sheep and wool are concerned instruction is given in woolclassing at the sheds if desired, as well as attention to all ailments in sheep, and the Department is ready at all times to do anything to advance further the interests of the grazing industry, both in the interests of the State as a whole as well as in the interests of the individual grazier.

External Parasites in Sheep.

These consist of lice and ticks in sheep, both of which, if allowed free play, do incalculable harm to the wool clip, besides debilitating the animal itself in no small measure.

The only remedy lies in dipping, and in this connection the utmost care should be exercised in the choice of the material used. It definitely pays to use a good dip, and one having been decided upon, particular notice should be taken of the manufacturers' recommendations as to mixing. The correct time to dip, when practicable, is from a month to six weeks off shears.

When prices for wool are anything like normal, dipping is a payable proposition; apart altogether from the extermination of external parasites. The cost of the operation should be more than returned by the increased price of wool. Dipping, too, has its points as a deterrent to blowfly attack.

Internal Parasites in Sheep.

The common internal parasites are stomach worm (*Hæmonchus contortus*), nodule worm (*Oesophagostoma columbianum*), and tape worm (*Tænia expansa*).

Early symptoms should be detected in the flocks by way of avoiding a heavy infestation. Sheep sometimes for no apparent reason lose condition, develop a hump in the back, sometimes scour, the membrane of the eye and nostril becomes noticeably white, likewise the skin. There is an inclination to lag behind the flock, and lie down with the head stretched right out.

Post-mortem examination will reveal the presence of the stomach worm in the fourth stomach. The nodule worm's presence is shown by cheesy-like pimples or nodules along the whole of the gut, hence the name sometime applied—"knotty gut."

The tape worm will be found along a great length of the bowel and, in some cases, attains great length, sometimes as much as 12 feet.

The remedy in all cases of worms lies in systematic drenching with one or other of the following specifics:—(*a*) Epsom salts, arsenic; (*b*) Epsom salts, arsenic, and bluestone; (*c*) bluestone and mustard; and (*d*) carbon tetrachloride.

All four drenches have their particular uses. In severe cases, I favour the arsenic and Epsom salts drench with the addition of bluestone, mainly on account of the fact that it is more likely to act on all worms.

Some people have a prejudice against the use of arsenic, but long experience has taught us that this prejudice is groundless. In the doses prescribed the effect is more tonic than destructive.

Arsenic and Epsom salts is a good drench where stomach worms or tape worms are present. Bluestone and mustard, too, is a proved drench, and in respect of this specific it is well to mention that as the drench is 4 oz. as against 2 oz. of the others, additional care should be taken in its administration. With inexpert hands the drench is likely to find its way to the lungs, pneumonia resulting.

Carbon tetrachloride given with a syringe or gun with 2 c.c.s. and 3 c.c.s. of paraffin oil has proved effective in the case of stomach worms, but has definitely been proved to have no effect on other worms. On thing in its favour is the fact that it may be used without starving the sheep. This is important when one may be delayed on the road with weak sheep, and when it would be disastrous to starve the animals for the necessary period when using the other drenches.

* In a radio address from 4QG.

Better Rams.

For many years the necessity for using better rams has been urged. The cost, we know, has been a deterrent these bad times, but judged from every point of view the producer is not getting the best out of his flock when using indifferent or poor sires. One imagines an owner putting a lb. of wool per head on his flock and gaining the consequent financial benefit as against the additional cost of his rams. Not only better rams, but rams suitable to the country, the rainfall (or lack of it), and the power to withstand hardships generally should be chosen. A type suitable for one district may prove a failure elsewhere. To the younger graziers a careful study of the choice of sires used by the older and successful graziers within their districts is advised. Advice on this important matter may be had on application to the Department of Agriculture and Stock.

Culling.

This operation, so necessary for the building up of a good flock, is, generally speaking, not sufficiently practised. Taken in conjunction with the use of better rams, no yearly practice on the property is of more importance. It should be the object of the grazier to fix a type suitable to his district and conditions generally. Of the utmost importance is the choice of this type. Among the ewe flocks everything should be rejected not coming up to this standard. Being not true to type, uneveness, malformation, over-strength in the fleece, ultra fineness possibly, want of size or constitution, all call for the rejection of such sheep as the future breeders.

No domestic animal known responds so quickly to careful selection and breeding as the sheep, and in no case do such quick profits result. In breeding remember too violent a contrast in mating throws the progeny all ways.

Stock Licks.

The use of a suitable lick in some districts, particularly during the winter months, or during periods of drought, is an absolute necessity, and I think graziers in districts where there is a mineral deficiency in the pastures would be well advised to supply their flocks with a lick, especially during winter.

The choice and use of a lick should be determined by proved mineral deficiencies in the pastures and water to which stock have access. The grazing areas of most of Australia are notoriously deficient in phosphates containing that important ingredient to body building—phosphoric acid (P_2O_5). Phosphates, then, should form the base in nearly every case of animal nutrition. Other ingredients should be added as the necessity dictates. For instance, salt is a necessity in most cases, but should the supply of water be saline, salt may be greatly reduced, or altogether eliminated.

A tonic action may be required; sulphate of iron prescribed in certain quantities will supply this. A laxative may be required (especially on very old winter feed or on scrub); Epsom salts will fill this necessity. For some time past it was thought that the use of iodine (potassium iodide) was necessary. This, however, has been disproved.

It will be seen how necessary it is to supply the particular want of wants, in some districts especially. During a hard winter the addition of a protein in the shape of a meal may be advantageous to the flock.

For the reasons given, graziers are advised to have the necessary materials on hand, with the object of mixing the lick as required, adding those ingredients required for the special purpose and leaving out others as circumstances dictate.

A note of warning may be sounded with regard to salt. There is a popular opinion that the animal is the best judge of how much salt to take. This may be right with regard to dry sheep, but in the case of ewes in lamb and half way through the period of gestation there is a distinct danger of supplying too great a quantity. For the ewes mentioned and at the period stated the supply of salt should be greatly reduced or altogether eliminated.

Woolclassing.

Too much stress cannot be laid on this important part of the business during the graziers' harvest.

While prices for wool have been so depressed, some owners have neglected to make the best of their clips in the matter of good and scientific classing. Any neglect in the get-up of the clip is false economy, especially when prices are down and the last shilling is called for.

There may be many indifferent classers, but the grazier would be well advised at all times to pay a good man for this important work. The wages may be regarded as an economy, and with a competent classer there should be a substantial surplus.

Overstocking.

The practice of overstocking cannot be too severely condemned. We know the temptation in a good season when grass is plentiful and money available, but, taken over a period of years, there is no doubt whatever that the owner who stocks well within the carrying capacity of his holding will come out well ahead of his neighbour owner who indulges in the practice of overstocking.

Too often overstocking results in the fact that sheep cannot be removed when necessary. Again, during a dry time the wool clip is deleteriously affected. Two well-fed sheep will be found more profitable than three half-fed animals, and generally the whole station management is simplified when sheep are maintained in good condition.

Parasites of all sorts are more likely to attack flocks on an overstocked property than one on which the sheep are adequately fed.

The Blowfly Problem.

Up to the present time the method found most effective is jetting. Where partial failures have been reported, we have reason to think that the operation has not been properly carried out. A plant to give the necessary pressure is essential, and the utmost care must be taken to see that the ingredient used gets right on to the skin. Judged from an economical point of view, good results have followed the use of arsenic 7 lb., washing soda 6 to 7 lb., and soft soap 1 lb. to the 100 gallons of water.

The pressure required varies with the quantity of wool, and one should vary it accordingly; from 100 lb. to the square inch up to 160 lb. to the square inch will be found sufficient. Satisfactory results have been achieved with the use of some of the better known powder dips, and there are on the market other preparations which are both economical and effective.

Drought Fodder.

There always appears to me that there is something wrong in the scheme of things when periodically we lose such vast numbers of sheep through the ravages of droughts. While all prices in the industry are so depressed and stock values are so low, it may not be the right time to mention this matter. However, we will take it from the point of view of moderate seasons and moderate prosperity.

I would like to propose what may be regarded as an insurance scheme against loss. During lush seasons both lucerne hay, well baled, and maize grain is relatively cheap, and provision could be made by graziers, during these good seasons, to put some capital annually into these commodities with the object of forming a fodder reserve for the inevitably recurring dry time. Neither well baled lucerne hay nor maize may be regarded as perishable, if properly stored.

The usual practice with owners in a position to do so is to buy when the drought is upon them. This means enormously enhanced prices for the fodders, and too often a real difficulty in getting supplies at all.

Wise Expenditure—Over-improvement.

My remarks under this heading are chiefly addressed to the young grazier and selector starting out to improve new country, or to establish a selection on old sheep areas. Much money, and borrowed money at that, has in the past been spent on unreproductive improvements. On the other hand, in some cases wise expenditure has not been undertaken to the eventual loss of the settler.

Every intended expenditure should be carefully thought out and every pound made to pull its weight. Water conservation where necessary should have a first call on capital. Fencing demands special thought. The cost of many a mile of fencing could have been saved if the advice of an experienced grazier had been sought previous to its erection. Ringbarking, where necessary, is almost always a judicious expenditure, but the areas to be operated upon should be carefully chosen. If an expenditure is worth while, the work resulting is worth doing well. Makeshifts never pay on a selection, and the continual cost of upkeep is always a drain.

To sum it up, the young grazier would be well advised, in a general way, to put the capital available into the improvements from which his income is to be derived.

PIGS AT THE BRISBANE SHOW,

By E. J. SHELTON, H.D.A., Senior Instructor in Pig Raising.

MUCH enthusiasm was displayed at the Pig Pavilion at the Exhibition Grounds, Brisbane, during Show week, when a large and varied collection of stud pigs in several breeds were penned, together with an instructive and interesting display of porkers and baconers. As is usual at such gatherings, many interstate and numerous overseas visitors were present and enlivened the gatherings by useful and constructive argument, particularly the Irish visitor who assured everybody that there is no bacon on the British market that realises more than that marketed by Pat, Mick, and Co., whose knowledge of pig lore is world-wide and very well understood.

Included among interstate exhibitors was Mr. Ted Charlish, of the Norfolk Stud, Camden, New South Wales, who carried off championships in the Large White and Middle White senior boars, Middle White sow, and reserve champion in Large White sows, as well as numerous other prizes, including Large White breeder's group.

Mr. M. Moffatt, of Byron Stud, Billinudgel, New South Wales, again carried off premier award in the Tamworth Boar classes with that very much admired champion boar Byron Restart, who has a lengthy list of championships to its credit, and is still in good form, although showing heavy development of the forequarters—a characteristic that develops in strong masculine boars as they advance in age. Byron Restart 1767 is a very noted son of the imported Whittingham Restart purchased in England several years ago by the New South Wales Pig Expert, Mr. A. F. Gray. Mr. Moffat will, in all probability, be an exhibitor at the Sydney Royal in 1934, where he hopes to pen a representative display.

Messrs. I. M. Cash and Son, of Ferndale, Jindivick, Victoria, were also exhibitors at Brisbane. Although they were not fortunate enough to secure awards, they effected satisfactory clearances of their pigs at auction. St. John's College, Woodlawn, New South Wales, penned a large exhibit, their representative—the genial Father Monaghan—being a constant visitor to the section.

Mr. Len S. Ducat, who a few years ago had a very large entry, was once again included among the visiting exhibitors, and appeared to delight in renewing acquaintance with friends of former days.

Thirty-four exhibitors penned pigs at this year's show—quite an array in comparison with the mere handful of ten or twelve years ago.

Visiting judges included Mr. A. F. Gray, New South Wales Pig Expert, who adjudicated in Tamworths, Poland-Chinas, Wessex Saddlebacks, and Large Blacks. Mr. G. A. Bedwell, who judged Berkshires, Large and Middle White breeds. Mr. C. H. Shelton, of the Queensland Co-operative Bacon Association Factory at Murarrie, judged the commercial classes. Mr. J. P. Bottomley, the genial chairman of the Royal National Association Council, is officially recognised as steward-in-chief of the Pig Section. Mr. George White was the officer in charge of the Pig Pavilion, Mr. Chas. Lee being the honorary council steward.

Berkshires.—Imported blood secured premier honours in this breed, Mr. Mat. Porter's Grafton Trump, sired by Ridgemoor Pygmalion 5th 1012 (imp.), being champion boar. This immense animal, a son of the imported sow Highbury Lady 2nd 9954, was born at the Grafton Experiment Farm, New South Wales, and has already secured champion awards at several other Queensland shows.

The Victorian-bred sire Caraalulup Harry 10020 owned by the veteran Mr. H. Franke, of Cawdor, won reserve champion, while a son of this fine animal in Cawdor Happy Lad 11603, owned by Mr. O. L. Klein, of Ma Ma Creek, was placed third. These pigs created considerable interest, particularly as at last year's show the champion boar was unplaced, apparently being considered as carrying too much of the "English" and not enough of the "Australian" type for the judge on that occasion.

Goodna Mental Hospital, whose representative, Mr. Tom Price, was again to the fore, did not secure a place in the senior boar classes, but carried off the coveted blue with Goodna Master in the under 21 months boar class, in which Gatton College secured second award with Gatton Premier.

Three very choice Berkshire sows and litters were penned, again emphasising the productive powers of this breed. Here the reserve champion sow, Cawdor Venus, was placed first, with the exhibits of Gatton College and Mr. J. W. Handley occupying second and third places.

The champion sow was Mr. Mat. Porter's Roselock Tessie 11355, who had not, at time of judging, produced the litter expected of her to have her included in the sow and litter class. This occurrence emphasises the wisdom of allowing for due transfer of a sow from a "dry sow" class to that of a "sow and litter," and vice versa, if occasion requires.

One cannot pass from the Berkshire classes without remarking on the evenness of entries and the lack of inferior sorts. The judge did not please everybody, but was honest in his decision to keep to the type he considers most suited to trade demands. Needless to add, there were many excellent "runners-up," particularly in the classes for mature stock, the prize list being all too short for the numerous entries penned.

Mr. H. Franke won the prize in the Berkshire boar and progeny class, also in breeder's group, in which there was very keen competition.

Large Whites.—Although the number of exhibitors was limited, the entries were large and comprehensive, competition being strengthened by the team penned by Mr. E. Charlish, of the Norfolk Stud, Camden, New South Wales, who accounted for several important awards, his Norfolk King John 1st 2016 being champion boar and topping the stud sales at 20 guineas, this fine animal now being the property of Mr. H. B. Kerner, of Warwick road, Ipswich, a prominent exhibitor at many Southern Queensland shows. That very fine animal—the son of the Sydney Show champion, Wall King David 14th (imp.)—known as Norfolk King David 5th, owned by Gatton College, Queensland, was placed reserve, but is quite as good, and being "proved" is that much better as a stud sire. These two boars will doubtless fight it out at numerous shows here in future, and they will be a centre of interest wherever penned.

In Large White sows and litters, the Kingston Pig Farm Company's Kingston Poppy secured the premier award over the College sow Jerseyholm Canadian Patricia; both sows were rearing vigorous families of splendid type.

The champion sow was Pine Terrace Iris (imp.), a New Zealand-bred sow shown by the Kingston Pig Farm Company.

Middle Whites.—Three years ago there was one Middle White pig penned at Brisbane. This year the number increased to forty—a very fair exhibit in a State where, as yet, the Middle White is not well known. Together with the Large White, they are included as the special breeds under Queensland's Better Board Subsidy Scheme; so that with an increase in the trade in frozen pork, and the general tendency to improve breeding stock to provide for expansion of overseas trade, the future of these two breeds seems assured. The veteran Sydney champion, Norfolk Nobleman 3993, secured the premier award, and with other purebred sires and dams with championship honours annexed the special ribbons provided by the Australian Stud Pig Breeders' Society. A son of the champion, shown by Mr. J. J. Slack, secured reserve champion, and will no doubt in due course reach the top of the pole. Competition in this breed was confined to the exhibits of Messrs. E. Charlish, I. M. Cash and Sons, and Mr. J. J. Slack, of the City Cash Butchery, Ipswich, Queensland. The champion sow was Norfolk Favourite 2nd, owned by Mr. Charlish; she is a daughter of the imported Pendley Deliverance 2nd 4190, a great and productive sire. The classes in this breed were somewhat limited, but with increased entries, better prize money, and more opportunity, greater competition may be looked for.

Tamworths.—Mr. A. F. Gray, of New South Wales, had a severe test of strength and endurance in the long and difficult day experienced in judging the several breeds that came under his control. In Tamworths, quality was paramount, and at no previous show were there so many attractive and well-set-up animals.

Mr. M. Moffat, of Billinudgel, New South Wales, secured the premier award, being closely followed by a very choice quality sire in Wattledale Bill, shown by Mr. J. Barkle, an animal a judge might readily have placed ahead of the senior boar. Mr. Barkle had a very fine team and secured the prize for boar and progeny, breeder's group, and a comprehensive list of awards in other classes. As in Middle Whites, competition was restricted, but the studs represented were of the very best and included also Messrs. P. J. and D. F. L. Skerman, of Kaimkillenbun, G. H. Woodall and Sons, of Kingaroy, Mr. W. S. Hendry, of Clifton, St. John's College, Woodlawn, New South Wales, and Wide Bay Stud Piggery, for whom Mr. R. Williams was Messrs. Drummond and Parke's representative. Mr. E. L. Melville was also an exhibitor.

Mr. W. S. Hendry's Byron Challenger, champion boar at Toowoomba Show, again secured a proud win in a class in which Wide Bay Stud Piggery secured the red ribbon. In sows Mr. J. Barkle secured both the championship and reserve championship awards with stock fit to win in any show in the world. The sows

and litters were very choice, Mr. G. W. Winch penning his Traveston Viola for the first time. Mr. G. E. C. Stephen, of Toll Bar road, secured a prize or two and had a big team forward, while Mr. H. B. Kerner, of Ipswich, penned the Victorian-bred sow Warringal Precocious, and secured a coveted blue. This sow is a daughter of the imported Berkswell Constance, and has a great future before her. Mr. Barkle finally annexed the silver cup presented by the National Pig Breeders' Association of England and which, to fulfil stipulated conditions, had to be won on three separate occasions with different animals.

Poland Chinas.—This breed was represented by four exhibitors only, the total entry being a dozen head; the difficulty of securing unrelated blood and the uncertainty of the position in regard to the breed's future counting against extension of competition.

Mr. F. E. Grimsey penned the champion boar, Flagstone Lad, bred by Mr. W. H. Sauer, of Miva, Mr. Sellars' Allambies Roger being the runner-up, the latter's Flagstone Dulcie being champion sow, both boar and sow being the progeny of that very fine old sow, Broxburn Select.

Wessex Saddlebacks.—Better entries and increased interest emphasised extension of competition in the white-collared breed, in which Mr. R. Turpin and his co-workers (his sons) and Mr. C. F. Marshall and Mr. A. Mahaffey were prominent exhibitors. The champion boar was bred by Mr. Turpin and shown by Mr. and Mrs. A. Alford, of Traveston, who in former days in the "Old Land" bred and handled this breed to advantage.

Both imported animals secured prominent awards, the more recently imported sow, Maiden Beech Ringousel, being placed second to the earlier importation, Holmsleigh Ace.

Large Blacks.—Mr. D. R. Law was the sole exhibitor, his entry totalling half a dozen head in two classes. Somehow or other the Large Black does not make progress in the North, and their future is very doubtful.

Porker Pig-raising Competition.—A feature at the Brisbane Exhibition was a new competition styled as above, designed to afford pig breeders opportunity of demonstrating their ability to produce large, fast-growing litters of pigs which meet the requirements of the pork trade. Judging was on a basis of suitability of the pigs for the pork trade, and litter weight for age, and although shorn of much of its earlier importance was productive of excellent results. Five entries (in all about fifty pigs) were penned, and results favoured Mr. J. J. Slack, represented by Mr. T. M. Wallace, with Mr. P. V. Campbell second, the first prize pen being Middle White Tamworth cross, the second prize lot being of Chester White origin.

Kingston Pig Farm Company, Gatton College, and Wide Bay Stud Piggery were the winners in the local bacon, while in export baconers Kingston Pig Farm Company was placed 1st, Wide Bay Stud Piggery 2nd, and Gatton College 3rd.

TUBERCULOSIS IN PIGS,

By J. A. RUDD, L.V. Sc., Department of Agriculture and Stock, Brisbane.

IT is essential that, to keep pigs healthy and free from infection, they should not be allowed or brought into contact with stock affected with tuberculosis or other disease. Young animals, particularly pigs, are more susceptible to disease than those which are mature. The majority of pigs condemned at bacon factories and abattoirs are young pigs under twelve months of age, and a large percentage of these pigs are under six months old.

It is apparent that these animals must have picked up infection either from consuming infected food—i.e., cow's milk saturated with tuberculosis, or from diseased meat, offal, and blood from infected animals which have either died or been destroyed on the farm. When advised by the management of abattoirs, meat-works, or bacon factories that pigs have been condemned for disease, an effort should at once be made to concentrate on all possible sources of infection. All cows infected with mammitis should be immediately isolated and vaccinated for mammitis with gradually increasing doses of vaccine. The vaccine and directions for use could be obtained at the Animal Health Station, Yeerongpilly, Queensland. All cows which do not respond to treatment under direction (i.e., about 2 per cent. of all herds have tuberculosis of the udder) should be destroyed. There are, however, other sources of infection, and these should be carefull examined, such as surround-

ings and troughs. All troughs which are so old as to be worthless should be discarded and their places taken by fresh wooden or other troughs. Fowls are a constant source of infection, as they carry avian tuberculosis and infect pigs. Fowls should not be allowed to roam at large among pig-sties or in the stables. Fowls are particularly dangerous if the dairy herd is infected with tuberculosis, as they become infected and in turn infect the pigs.

The application of the tuberculin test to the dairy herd should be considered in relation to the general process of cleaning up, but this does not affect the result if fowls are allowed access to the sties and paddocks in which pigs of all sizes and ages are kept, as they will continue to infect the pigs. A large percentage of head and throat infections are due to avian tuberculosis.

As the life of the pig is short and his commercial value proportionately small, any check from disease is a grave disadvantage and makes the keeping of pigs the reverse of a commercial proposition. Prevention is by far the best, and all avenues should be explored in order to make certain that healthy stock alone are kept, and all likely sources of infection so guarded that the possibility of wastage from disease is practically wiped out by taking such measures as will ensure that only healthy pigs are bred and kept on the farm.

OCTOBER PIG SCHOOL.

ARRANGEMENTS have now been completed for holding the annual school of instruction for those interested in the breeding, feeding, and marketing of pigs. The school is to be held at Gatton College, commencing on 2nd October, and concluding on 13th October. Applications are now being received, and those who are able to arrange attendance should lose no time in lodging their applications with the Principal, Queensland Agricultural High School and College.

Concession fares by rail are available throughout Queensland, and the school fees (approximately £3 10s.) include all charges for board residence, instruction, and excursion to bacon factory. The Principal, Professor J. K. Murray, is anxious to have all applications as early as convenient, in order to arrange accommodation; hence those interested will materially assist by prompt attention in order to save disappointment.

Professor Murray advises that there need be no fear on the part of farmers with regard to attendance at the school by members of their families, provision having been made for accommodation, meals, recreation, and instruction, and those attending can be assured that their personal wants will not be overlooked. The social side of the school is a special feature. Every evening, before the lecture session begins, opportunity is afforded for a free and easy hour, during which questions relative to any phase of agriculture may be asked. At these sessions officers attend who are associated with other branches of College life, such as the Instructor in Animal Husbandry, the Plant Breeder, and the Horticulturist. In fact, question time is one of the most valuable periods of the day for those engaged in dairying, fruitgrowing, or in general agriculture.

The evening cinematograph and lantern lectures are of great interest and are much appreciated. As opportunity offers, other authorities on agriculture attend to address school members; there are illustrated lectures on tuberculosis in cattle and pigs; poisonous weeds and plants; farm bookkeeping; also outdoor talks on various types of agricultural and dairy machinery. Visits to the school by representatives of the Queensland Branch of the Australian Stud Pig Breeders' Society, the Queensland Pig Industry Council, and the Royal National Association are also appreciated.

At the College piggery more than 200 pigs are kept. These comprise representatives of several breeds for stud purposes, as well as the production of pork and bacon. Results of a series of experiments in the feeding of pigs will be available. A special item in the programme is a visit to the metropolitan bacon factories, where various operations associated with the manufacture of bacon and ham are seen in full swing. This year it is proposed to arrange a visit to the Brisbane Abattoir. In addition, a visit wil be paid to the milk and cream testing floor, the Agricultural Chemist's laboratories, and the Entomological Museum at the Department of Agriculture and Stock. Further particulars and railway concession forms may be obtained from the Principal at the College, or inquiries may be made at the Department of Agriculture and Stock, Brisbane.

CRUELTY TO TRAVELLING STOCK.

Taken from the last annual report of the Queensland Society for the Prevention of Cruelty:—

THE cruelty associated with the transport of stock by rail is a matter about which this society has been much concerned. It is recognised that a certain amount of rough usage is inseparable from cattle conveyance by rail, but there are certain preventive measures that, if observed, would minimise the cruelty and loss associated with railway transport of stock. Those measures are: Care in trucking, not to over-crowd, so that if a beast gets down it can get up or be put on its legs again. Then comes careful driving of cattle trains, avoiding sudden stopping or fast travelling on sharp bends, and then when an animal gets down steps should be taken to get it on its feet before it is trampled to death. Here is an extract from the "Courier" of the 6th June, 1933:—

Stock in Truck—Some Trampled to Death—Overcrowding Alleged.

"The danger of loss through overcrowding of cattle trucks is emphasised by a report from a Yeulba correspondent, who states that on Tuesday last a gang of fettlers at Yeulba took six hours to clear a truck in which four fat bullocks, of a consignment of twenty-one, had been trampled to death. Two other animals were so badly maimed that they had to be destroyed, and the rest suffered from broken horns and bruised bodies and heads. The bullocks, the correspondent states, were loaded into a K wagon at Roma, and were consigned to the saleyards at Cannon Hill, Brisbane. On the arrival of the train at 3 a.m. on Tuesday the railway officials refused to allow the truck to go forward, and a gang of fettlers was summoned to unload the cattle and release them from their sufferings."

Apart from the cruelty involved the economic loss must be considerable in the course of a year. In the first 30 miles of the journey referred to in that paragraph the loss sustained is about £60, and it must be remembered that there are more cattle transported by rail in Queensland than in any other State in the Commonwealth.

The time stock trains take to cover a journey is unusually long in Queensland. Here are the times of passenger and stock trains over the same journey—

	Miles.	Mail train. Hours.	Stock train. Hours.
Charleville to Roma Street	483 ..	21¾ ..	33½
Roma to Roma Street	318 ..	13½ ..	21¾
Longreach to Roma Street	823 ..	39½ ..	54

and compared with New South Wales our stock trains are on the slow side; for instance, a stock train from Bourke to Sydney takes 29½ hours to cover 521 miles, while a stock train from Charleville to Brisbane, 483 miles, takes 33½ hours.

It therefore is obvious that something could be done to shorten the time of stock trains over such routes.

As to other remedies, it may be mentioned here that of recent years in New South Wales an inspector from the Society for the Prevention of Cruelty is continually travelling on stock trains and reports on any irregularity or carelessness on the part of the train crew or the men who are travelling in charge of the stock. It is alleged that formerly the drovers on reaching stopping places were more concerned about seeking refreshment than about seeing to stock that might be down, &c. But now they are alert and see about getting any down animals on their legs again. It is claimed that the result of having the inspector on the trains is that in two years the losses in stock have been reduced by about 6 per cent. We understand that the stock-owners' association assists the society to the extent of the inspector's salary.

Another form of cruelty associated with the transport of stock by rail is that of trucking sheep which are heavy with lamb. The rush and struggle of trucking and the effect of the railway travelling is that the unborn lamb becomes displaced. While there is some excuse for trucking sheep in this condition from a drought-stricken area in an effort to save them, there is no excuse for trucking them to market, and recently we have had the peculiar experience of seeing some of these sheep dropping their lambs in the yards while they are being sold to the butchers for slaughtering purposes. On inquiry we were informed that this is prohibited by the Stock Department of other States, and in all seriousness we would ask our Queensland Stock Department to consider if this sort of thing should be allowed to continue.

Overcrowding of Poultry.

From the same report:—

There were ninety-five cases of overcrowding poultry in crates or jamming fowls in low crates in which the birds could not stand up. In some of these crates the top is of wire-netting, through which the birds put their heads; then, when other crates are tossed on top of them, either in a railway truck or when being carted from the railway to the poultry dealers' places in Brisbane, in many instances the birds get their heads almost torn off. We have progressed some distance in getting poultry raisers and dealers to improve the conditions under which they transport and handle the birds; but there still are cases coming under notice where, through callous indifference, brutal cruelty is inflicted. This is a Prevention of Cruelty Society, but when people ignore our warnings and repeat acts of cruelty, then they will have to answer to the Courts. The offender will find this expensive in time, money, and reputation. We have had several such prosecutions, and to avoid this all we ask poultry raisers to do is to transport their fowls in crates that are higher than the birds, and give 1½ cubic feet space for such birds as fowls and ducks, and a correspondingly increased space for larger birds; have a closely-boarded top and bottom to the crate, so the birds' heads and legs do not get through and get mangled, and wire-netting sides for ventilation; and provide food and water, especially for long journeys.

This is a matter about which we have had many protesting letters from producers and progress associations complaining that the space required is too great, and the conditions should not apply to birds that travel only a short distance to the city and are only a few hours in the crates. Our answer is that the space required for the various classes of birds is that fixed by the poultry experts of the State Agricultural Department. With regard to the time the birds are in the crates, we are aware that they are usually crated after going to roost in the evening and despatched to market next morning. They are sold usually between 10 a.m. and 1 p.m., are mostly taken delivery of in the afternoon, and in most instances are kept crated until required for the table. Thus it will be seen that thousands of birds coming into the city each week-end, that are crated on Thursday, sold on Friday or Saturday, are kept crated until the cook starts to prepare them for Sunday's dinner. In such circumstances we say we are not unreasonable in requiring that those birds should have room to stand up and have food and water provided. We should not like to hamper the poultry or any other industry, and our experience has been that poultry raisers have suffered their greatest loss by the death of the birds through overcrowding in crates, especially in hot weather.

TO SUBSCRIBERS—IMPORTANT.

Several subscriptions have been received recently under cover of unsigned letters. Obviously, in the circumstances, it is impossible to send the Journal to the subscribers concerned.

It is most important that every subscriber's name and address should be written plainly, preferably in block letters, in order to avoid mistakes in addresses and delay in despatch.

LEGISLATION REGULATING THE SALE OF SEEDS FOR PLANTING OR SOWING.

By F. F. COLEMAN, Officer in Charge, Seeds, Stock Foods, and Fertilizers Investigation Branch.

Definition of Vendor.

A vendor under the Pure Seeds Acts is any person who sells or offers or exposes for sale or contracts or agrees to sell or deliver any seeds.

Invoice to be Given by Vendor.

The Acts require that on the sale of any such seed of not less than 1s. in value, the vendor shall at the time of the sale give to the buyer, or, if the buyer is not present at the time of sale, forward to him an invoice containing the statements required by the Acts.

The wording of the invoice should be to the following effect:—

> "The seeds mentioned in this invoice are for planting or sowing. Such seeds are of the kind or kinds specified, and contain no greater proportion or amount of foreign ingredients than is prescribed with respect to such seeds."

Seeds Sold in Made-up Packets to have Year of Growing Marked.

In the case of seeds in pictorial or other made-up packets, the year in which such seeds were grown must be clearly and indelibly marked upon the outside of each packet.

Definition of Foreign Ingredients.

"Foreign ingredients" shall include inert matter, seeds of weeds, and seeds of any kind other than the seeds in question; or dead, diseased, insect infested, non-germinable, or hard seeds.

"Inert matter"—Broken seeds less in size than one-half of a complete seed; or chaff, dust, stones, or any material other than seeds.

"Hard seeds"—Any seeds whose seed coats are so impervious to water as to delay germination.

Prohibited Seeds.

The following seeds are totally prohibited:—Seeds of *Cuscuta* spp. (Dodder), *Datura spp.* (Thorn Apple), *Ricinus communis* (Castor Oil plant), and diseased or insect infested seeds.

Quantity of Foreign Ingredients Allowed.

The quantity of foreign ingredients allowed in the various kinds of seeds is set out in the Regulations, a copy of which can be obtained on application to the Department of Agriculture, Brisbane.

Efficient Seed-cleaning Machinery.

The Regulations do not apply to—

Seeds sold by the actual grower direct to any vendor in possession of one or more efficient cleaning machines, for the purpose of the seeds being cleaned and graded before being offered for sale as seed for sowing.

Samples from Bulk in Sender's Possession.

The Regulations provide for the examination of samples at the Seed Laboratory, Brisbane, the cost being the nominal one of 2s. 6d. for each Certificate of Analysis. When sending such samples, it is of the utmost importance that they be drawn by the sender from seeds in his actual possession, care being taken to make them truly representative of the bulk.

To enable this to be done satisfactorily they should be drawn alternatively from the top, middle, and bottom of the bags, the proportion of bags to be sampled being as follows:—

1 to 20 bag lots—Sample should be drawn from not less than every bag.
21 to 40 bag lots—Sample should be drawn from not less than 21 bags.
41 to 60 bag lots—Sample should be drawn from not less than 28 bags.
61 to 80 bag lots—Sample should be drawn from not less than 32 bags.
81 to 100 bag lots—Sample should be drawn from not less than 36 bags.
100 to 200 bag lots—Sample should be drawn from not less than 40 bags.
200 bags and over—Sample should be drawn from not less than 20 per cent.

If, when drawing samples, it is observed that great variation occurs in the bulk, two or more samples should be obtained, each representing bags whose contents are similar.

After the sample has been drawn as above indicated it should be emptied out on to a large piece of paper, thoroughly mixed, and then a quantity not less than the prescribed weight for such samples should be drawn for purposes of forwarding to the Seed Laboratory. A duplicate sample should be kept for reference.

In the Seed Laboratory, great pains are taken to ensure absolute accuracy of work. It, therefore, follows that all this care is wasted unless the person forwarding samples for examination takes some trouble to ensure that the samples drawn truly represent the bulks they are obtained from. The minimum weight of each sample and marking should be as hereunder set out:—

Weight of Samples.

PRESCRIBED WEIGHT OF SAMPLES.

Kind of Seed.	Weight Required.
Barley, Beans, Cowpeas, Maize, Oats, Peas, Rice, Rye, Tares, Wheat ..	8 oz.
Canary, French Millet, Japanese Millet, Linseed, Lucerne, Prairie Grass, *Setaria Italica* (Foxtail Millet), *Sorghum Sudanense* (Sudan Grass), Sorghum, White Panicum	4 oz.
Paspalum dilatatum, Rhodes (*Chloris gayana*), Rye Grass, *Phalaris tuberosa*, Cocksfoot, Couch, etc.	2 oz.
Beet, Cabbage, Carrot, Onion, Parsnip, Radish, Tomato, Turnip, and Vegetable Seeds of like size	½ oz.
Vegetable Seeds in Made-up Packets	5 packets.
Agricultural and Vegetable Seeds other than those indicated above ..	2 oz.

In the case of seeds containing weed seeds or other foreign ingredients, double the weight above mentioned should be sent.

Marking of Samples

All samples must be plainly written on in ink, setting out the undermentioned particulars:—

(1) Name under which the seed was purchased, or is proposed to be sold;
(2) The number of bags from which the sample was drawn, and the number of bags in the whole consignment;
(3) The marks of identification, if any, on such bags;
(4) The name and address of the sender, with date of sampling;
(5) If the sender is not the actual grower, the name and address of the sender's supplier, with date of delivery.

Samples should be addressed as follows:—

Seed Sample for Examination.
Officer in Charge,
Seed Laboratory,
Department of Agriculture,
William Street,
Brisbane.

The sender's name and address and the particulars as before set out must be written in ink on the actual container.

Special care should be taken to securely fasten up the sample. The examination of samples received at the Laboratory that have been opened in transit is useless for any determination, as only a sample received intact can be taken as representing any bulk.

Fee of 2s. 6d.

A covering letter, enclosing the prescribed fee of 2s. 6d. per sample, should be addressed to the Under Secretary, Department of Agriculture, Brisbane.

Free Examination.

It cannot be too widely known that the Seed Laboratory at Brisbane examines, free of charge, all samples representing seeds that farmers have purchased for their own sowing.

Complaints.

In case of any complaint regarding purity or germination the buyer should at once send a sample of the seed, marked with the particulars as above set out, together with a covering letter to the Department advising of the despatch of the sample, which will be examined free of charge.

Certificates.

Unless the sender is careful to forward a truly representative sample, the certificate is valueless. Under no circumstances is it a guarantee by the Department of Agriculture as to the bulk, but a statement as to the condition of the sample at the time when such sample was examined.

Examine Goods on the Day of Delivery.

Both buyers and sellers are urged to examine all goods on the day of delivery, and when in doubt regarding any seeds, fertilizers, pest destroyers, or stock foods, to write at once to the Department of Agriculture, Brisbane, in order that the matter may be at once investigated.

IMPROVEMENT OF CITRUS STANDARDS.

The Minister for Agriculture and Stock (Hon. Frank W. Bulcock) stated recently that he had received a report from Mr. H. Barnes, Acting Director of Fruit Culture, who represented Queensland on the Commonwealth Citrus Committee which met in Sydney during the week.

The committee had discussed matters relating to inferior fruit and action necessary to improve the standard of production, the application of available knowledge held by the various States to the problems of production generally, organised marketing, and the position of the mandarin-growers, who were faced with a large production of fruit which was not saleable at payable prices.

Considerable good was likely to occur as a result of the deliberations of the committee, added Mr. Bulcock. It had been resolved that scientific research in various directions should be proceeded with without delay, and that a more wieldy committee than that which met in Sydney should be appointed from the Council for Scientific and Industrial Research and the Departments of Agriculture in the various States to set out in detail a programme to be expeditiously carried out. It was proposed that this body should absorb the present Citrus Preservation Committee, and that it should devote its attention to problems such as orchard factors, including suitable varieties, soil types, orchard management, maturity, handling and transport, and various problems relating to packing. The activities of the body would also include storage problems and overseas transport.

It was also resolved that sub-committees should be formed in each State representative of the local Department of Agriculture and the industry to work in conjunction with the head body for the purpose of investigating the problems peculiar to each individual State.

The Commerce Department, working in close association with the respective State sub-committees, was asked to undertake an investigation of the problems associated with the marketing aspect, and the Federal Citrus Council, in conjunction with the Commerce Department and the scientific committee previously mentioned, was asked to take up the question of shipping facilities at present available for overseas transport, and endeavour to obtain a more efficient service.

Considerable discussion had centred round a suggestion that the Commonwealth and State Governments should advance sufficient money to pay compensation for the destruction of 25 per cent. of the mandarin orchards in the Commonwealth. It was not possible to arrive at any finality on this matter, the representatives of the various State Governments being of the opinion that their respective Governments would not be in a position to accede to this request. It was finally decided that the mandarin industry in particular should be further investigated in each State, and that recommendations be made at a later meeting of the committee.

AGRICULTURAL NOTES.

By H. S. HUNTER, Agricultural Branch.

CROP PROSPECTS.

PROSPECTS for the coming season were greatly improved by the early August rains. An early spring is now pretty well assured, and early-planted crops are making good progress.

All agricultural districts from Mackay southwards are in particularly good order, and farmers have been encouraged to prepare large areas for early cropping. Attention is being given mostly to the planting of maize and potatoes. In some districts where plantings were made some weeks ago, the crops are above ground and making satisfactory growth, considering the cold weather. On the South Coast, where potatoes, in accordance with the usual custom, have been planted earlier than is possible in the districts subject to heavy frosts further inland, the combination of wet weather and frost has caused the tubers to rot, and consequently many growers in this area have had to replant. As the potato-grower must, of necessity, purchase seed imported from Southern States for the spring planting, a double planting is a somewhat expensive procedure.

The August rain was welcomed on the Darling Downs, where, perhaps, it was most needed. Although this winter has witnessed rainfall periods with unusual frequency, in practically every instance the precipitations recorded in the main wheat belt have been light, lighter than those received further west on the wheatlands of the Maranoa—and in the aggregate not sufficient to ensure a thorough saturation of the heavier basaltic soils of the Downs country. The young crops of wheat and barley, however, are away to a good start, and with a continuance of favourable seasonal conditions, the area planted would be sufficient to ensure a heavy crop. The main wheat planting was somewhat late this season, but where conditions permitted of sowing earlier the latter crops are being grazed by stock. In addition to the winter cereals, an appreciable area on the Darling Downs has been prepared for sowing with maize and Sudan grass.

Maize.

It is expected that there will be heavy plantings of early maize this year, as conditions are such as to guarantee the crops a good start. Although early-planted maize very often fails to produce grain, owing to the uncertainty of rain falling at the critical tasselling period, the crop is popular in the dairying districts, as it can be utilised for feeding to stock, or for conversion into silage, for which purpose it is unsurpassed.

If the experiences of previous season are any criterion, maize will be planted extensively on the Darling Downs this season, as this invariably happens after a light wheat crop.

Canary Seed.

The period during which wheat and barley can be planted with safety is now practically at an end, but the sowing of canary seed can still be proceeded with. This is a valuable sideline crop for the wheatgrower, particularly the farmer who combines whatgrowing with dairying. It provides a good fodder, but the crop's real value as a revenue producer lies in the Australian market for canary seed, which is protected to the extent of a duty of £16 16s. per ton on imported canary seed.

Efforts have been made in previous seasons to secure a reduction in the duty, on the score that Queensland supplies were smaller than requirements. If the industry is to be retained for Queensland, the local growers must ensure that the Commonwealth requirements are catered for, and that the seed produced is as free as possible from impurities and seed broken by the harvesting machinery.

The championship winner in the White Spring wheat class at the Regina World Grain Show, Mr. J. W. Eade, of Euchareena, New South Wales, also has to his credit a championship at Chicago, with "Gullen," a wheat of his own breeding from a cross of some of Farrer's types. The variety with which he won at Regina this year also is of his own breeding. It is named "Boomey," and has been evolved from "Cedar" and "Gullen."

Peanuts.

With a better season in view, peanut-growers are making arrangements whereby the present shortage of stocks will be remedied with the harvesting of the coming season's crop. Adverse seasonal conditions last year resulted in a short crop, which

enabled the surplus carried over from previous years to be disposed of, thus removing a problem which had caused some concern to the local industry. However, last season's harvest, plus the carry-over, was not sufficient to satisfy requirements, but the position has been met by the permission granted the board by the Federal authorities to import 350 tons of nuts of the Red Spanish variety, to be used for manufacturing purposes only.

The improved demand for the small Red Spanish nut creates a position quite different from that obtaining about five years ago, when this was the principal variety grown, but could not find an adequate market, except at oil values, owing to the preference for the larger Virginia Bunch variety. With limited supplies of Virginia Bunch seeds the Peanut Board at that time found itself in a dilemma, and unsuccessfully sought permission to import a large quantity of the seed. However, seed stocks gradually were built up, and the larger variety thereafter was produced in greater quantities.

The large attractive Virginia Bunch secures the cream of the trade—the nut-in-shell trade—but, whereas stained and discoloured shells until recently went to the manufacturers, they now find a ready market in a newly-developed shelled nut trade. Some authorities declare that the Red Spanish, although of unattractive size, really are of better quality than the larger-sized nuts.

Australia consumes annually between 3,000 and 4,000 tons of peanuts.

Clydesdales in Demand.

A recent survey of the forms of tractive power employed on wheat farms in Queensland reveals that 12,223 tractors and 16,764 horses are employed in this industry. Both tractor and horses are used by 753 wheatgrowers, and 1,300 farmers rely on horses only.

In the mixed farming districts, reliance is placed on draught horses to a greater extent than is the case in the wheat and sugar areas. Within the past decade there has been a noticeable tendency throughout the agricultural countries of the world for horses to come back into favour to some extent. This tendency has been accentuated in recent years by the low values of primary products, until at present there is an acute shortage of good breeding stock in the Commonwealth. A lucrative market here is attracting stallions and mares from New Zealand, and local breeders are reaping the reward of their foresight.

On 1st August an old custom was revived in Sydney in the form of a spring sale of stud Clydesdales, when 17 lots realised 2,250 guineas, or an average of 132 guineas per head. The top price at this sale was 230 guineas for a three-year-old New Zealand-bred stallion, but a bid of 480 guineas was refused for the stallion Confidence. At a similar sale held in Melbourne, where 140 stallions and mares were offered for sale, the top price was 470 guineas, and 60 stallions averaged 200 guineas. At the Brisbane Show sales 325 guineas was paid for one entire, and every animal showing quality realised more than 100 guineas. As most farmers are aware the ruling values of working horses are proportionately high. It has been advocated by the Department in the course of the past four years that farmers might well consider raising their own replacements of draught stock by breeding from, say, a couple of good mares each season.

Better Butter Marketing.

One difficulty with which the Australian dairying industry has to contend is the prejudice existing in Great Britain in favour of Danish butter, resulting in a lower price for Australian and its exclusion from the northern parts of the United Kingdom. Persons competent to express an opinion are unanimous on the point that this is largely due to the fact that Australian butter is practically unknown as such to the individual consumer.

The Federal Government and the dairy industry authorities are taking action to overcome this disability, but results will be a matter of time and will involve considerable expenditure in advertising. The butter export industry is of major importance to Queensland, and, incidentally, to every resident of this State. It may not be generally known that any Queenslander can assist in this effort of bringing to the notice of British consumers the high quality of our product by forwarding, through the Butter Board, small parcels of butter to relatives and friends in the old country.

Cold Weather affects Fruit Sales.

Continued cold weather during August had an adverse effect on the demand for fruit and on the quality of some lines. Pineapples, particularly, are suffering from the prevalence of "black heart," which involves sorting and an amount of

wastage. The canneries are relieving the fresh fruit market considerably, and in this way the position will be eased until the demand improves with warmer weather. Papaws are coming forward freely, but the demand is slow. Brookfield papaws, on account of their superior flavour, are realising top prices.

Strawberry supplies are in excess of those of past years, and considering the wet weather the quality generally is good. Although the jam factories are operating, prices are such as to leave little profit for the grower.

Surplus Citrus Production.

Growers of citrus fruits have received the welcome news that the New Zealand Government is prepared to permit the entry into New Zealand of oranges produced in South Australia. Although not what was hoped for, it will provide welcome relief to the local market. The New Zealand embargo has forced Australia to seek other oversea markets for surplus oranges, and the work done in this direction should be of much value during the next few years, when surplus production is expected to be increased considerably by new groves coming into bearing. Exports to oversea countries, other than New Zealand, have been encouraged by the Federal Government's guarantee of 13s. per case. Stringent export regulations have been issued which ensure that only good quality, attractively packed, and graded fruit will be exported.

The citrus-growing industries of the various States have recognised, through the Federal Citrus Council, that they must put their respective houses in order. At their request, the Federal Government has appointed an investigation committee, which, amongst other matters, will inquire into the production of inferior quality fruit.

Queensland Oranges and Apples.

The fruit section at the Brisbane Show was notable for the wide range of fruits displayed, and for the keen competition among the exhibitors. Southern visitors have expressed the opinion that Queensland is better adapted for the production of high-quality citrus fruits than the Southern States. In the apple classes Stanthorpe exhibits, though cold-stored for some months, triumphed over exhibits from Tasmania.

The main business of the committee appointed to investigate the citrus industry will be the collection of statistical information showing area and production of different varieties, with the estimated proportion of inferior fruit; also research work on the various problems associated with soils and stocks. In an endeavour to ease the Australian market a further shipment of oranges left for England in the course of the month, when 12,000 cases were placed aboard the "Chitral" at Sydney.

Success of the Brisbane Exhibition.

This year's Royal National Exhibition has exceeded all expectations, and could have been regarded as a remarkably good effort had it been preceded by a favourable season. The most outstanding feature, however, is the spirit of optimism and faith in the rural industries pervading the ranks of the country exhibitors and which has continued undimmed after over three years of depressed prices for agricultural products. The dairy cattle section, as usual, was notable for the quality and quantity of the entries. The pig section, which had expanded considerably, created more interest than usual, chiefly owing to the preparations now being made to embark upon a larger export trade, and as white-skinned pigs are favoured for this trade the classes set apart for these animals were watched keenly by pig-raisers. A feature of the section was the display of six typical sides of bacon, specially obtained from overseas countries which supply to the English market. Meritorious performances in this section were those of Mr. J. Barkle, of Kingaroy, who becomes the owner of the Tamworth cup, after winning it three times, and the Kingston Pig Farm Company, which won first and second prizes in the class for pen of three baconer pigs for the fourth occasion. On one other occasion this company secured first and third in this class.

In the farm produce section there were over 600 entries, the strongest part of which was that devoted to maize. The winning entry in a strong class for export maize gave a weight of 65 lb. to the bushel, or 9 lb. above the standard. This sample was of the Durum variety, and was grown by Mr. L. D. Christensen, of Crow's Nest, who, incidentally, also captured the honours in the One Farm Display. Second prize went to a Ninety Day sample, weighing 61 lb., exhibited by Mr. G. Meyers, of Imbil. Durum maize, which has won in this class on two previous occasions, is a cross between a dent and a flint type, and was evolved a few years ago by Mr. C. J. McKeon, maize specialist of the Department of Agriculture, especially to suit Atherton Tableland conditions.

THE AVOCADO.

By R. ALLSOPP, Queensland Acclimatisation Society.

THE earliest known records indicate that this fruiting species of the Laurel family, the Avocado (*Persea gratissima*), was native only to sub-tropical America, with a distribution from Aztec Mexico through Mazan Guatemala to the Peru of the Incas. The term Alligator Pear, while a misnomer, is commonly applied to fruits from the West Indies. Calavo is the name chosen by the co-operative growers of California to designate the type of budded varieties that have been developed through many years of careful scientific bud selection. Avocado is the name selected by the U.S.A. Department of Agriculture, also the Avocado Association of California, the Department of Agriculture and Stock, Queensland, and most other countries where this valuable fruit is cultivated.

The Avocado comes under two headings—thin-skinned and thick-skinned. Both are rich in fat—from 12 to 15 per cent. Experience teaches us that many types are unsuitable for Queensland's climatic conditions, and it is only by cultivating those types which have proved themselves that any success will be gained. For instance, some trees will thrive for a few years and then die out; others will persist in carrying heavy loads of fruit and then die out; others, again, are subject to sun-blotch and transmit this susceptibility to seedlings, and many are subject to fly attack. It will be seen, therefore, that if we are to establish this desirable fruit in this State great care must be taken. Like all other fruits, the Avocado is simply another perishable product, and must be handled carefully. The miracle notion must be discarded by the grower. Selection of site, type of soil, and fertilization are just as important, and varieties even more so. Rich well-drained soil and protection from winds are essential.

Before giving the information regarding the location and other points in Avocado culture, I think it would be advisable to quote an extract from the "Avocado Journal" (U.S.A.), which should no doubt be a useful guide: "The Avocado is not merely a passing fancy, for its cultivation has been practised for hundreds of years. The first Avocados were introduced into Florida in 1883, and California in 1856. The Avocado did not gain popularity very rapidly until about 1900, when the public began to realise the relationship of diet to health and happiness. Because of its dietetic value and delicious flavour, the Avocado now stands out as the fruit sensation of modern agriculture. Avocado culture is enshrouded in romance and suggestive of tropical islands and of old Mexico. It radiates the lure of the tropics and beckons irresistibly to lovers of the great outdoors. Nature has endowed it with fine qualities, and, like a siren, it has snared many unsuspecting victims and robbed many an old couple of the nest egg that was to have seen them through. This, however, is no fault of the Avocado, but largely due to unethical promotion schemes and high-pressure salesmanship. Thousands of acres of land totally unfit for the raising of Avocados have been planted, subdivided, and sold to people weary of the hustle and bustle of city life. A few profess to hold the secret of successful Avocado-growing and other fruits in the palms of their hands, and if one buys trees from them they will lead you along the narrow but rosy patch to success. These growers, of whom, fortunately, there are but few, together with the unethical promoters of alleged wealth-winning enterprises, have misrepresented the industry to such an extent that many small holders have been ruined."

I think, in the light of the foregoing extract, it is most essential to choose wisely and well the position and study its soil requirements before planting the Avocado, or, in fact, any other fruit trees, for that is the first and most important step if any success is to be achieved. That is even more so in the case of new introduced fruits and other plants.

Site of Avocado Orchard.

This should be an easy gentle slope, facing north-east and well protected from strong westerly winds. The soil should be at least 4 feet of rich loam with a sweet subsoil. The easy way to test a site is to dig out a hole from 3 to 4 feet deep and then fill it up with water; a good idea of what the subsoil is like may then be obtained by watching how the water soaks through.

Planting.

The best planting distance is 30 feet by 30 feet, and will give the better results over a longer period.

Varieties.

Thick Skin.—This means tough and leathery. The skin is no thicker than the thin-skin types, the only difference being that the latter are soft and offer no resistance to pests, and in most cases are attractive to them, especially the fruit fly.

There are over 250 named Avocados; many have been discarded for various reasons—low fat content, crop failing, sun-blotch, a tendency to overcrop for two or three years and then fail, low resistance to pest attack—fruit fly and scales, and so on.

The Queensland Acclimatisation Society has from time to time imported many varieties of the Avocado. These have been planted in trial plots and those unsuitable discarded, while types which have been proved suitable and desirable are worked up. This practice is being continued and as an improved type appears this is worked up, and the best only are kept. Otherwise, like many other products, there would be far too many types which would have to be discarded later on. The names below indicate the Avocados that have proved themselves suitable to Queensland conditions:—

Campbelli.
"Fuerte" Hybrid.
Blakeman. (Very good.)
Grande and Goodwood. (This fruit should be picked early and not let ripen on the tree.)
Justice. (Very good.)
Labourdonis. (Being tested out.)
Pankey (Queen). (Very good.)
Robinson. (Exceptionally good; largest fruiting.)
Wesser. (Being tested out.)
Wagner. (Being tested out.)
Spinke. (Very good.)

Worked trees will fruit from two years and always come true to type. As regards seedling trees, we cannot state any definite time of fruiting. Some may fruit in six years, while others have taken from twelve to sixteen years, and you must take what comes even then. All trees should be planted at the same depths at which they were growing when shifted from the nursery, and should be well watered and shaded until they can shade their own main stems. They should be headed back to form a good strong frame.

Fertilizer tests are being carried out and information on this point will be given later. Growers and intending growers should seek reliable information on all cultural and other points in the right quarter, rather than risk being misled as to the characteristics and requirements of the Avocado.

PIG IMPROVEMENT SCHEME.

Pig-raisers are reminded that application forms are now available, on written or personal request to the Department, for use in connection with the better boar subsidy scheme. There are two forms, one for use in cases where the farmer desires the Department to select and forward the boar and [or] sows, and the other in which the farmer desires to purchase the pig or pigs himself and needs financial assistance.

The subsidy scheme covers only Large and Middle White boars and sows, and is a special measure intended to focus attention on the importance of the white-skinned pigs for export.

When making application for forms, the applicant should state clearly the class or classes of pig he desires to purchase and state under which of the two headings he desires to be included. The maximum subsidy payable is £5 5s. for any one pig, or 50 per cent. of the purchase price of the animal if the subsidy is less than £5 5s.

Early application is desired, so that arrangements may be completed for delivery of the stock. Applications should be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane.

FODDER TREES AND PLANTS AT BUCKLETON, SPRINGSURE.

By MRS. ADA M. McLAUGHLIN.

For some years past Mrs. McLaughlin has been sending specimens of the trees and plants of the Springsure district to the Government Botanist (Mr. C. T. White), and at his suggestion has put on record her observations on the fodder value of the trees, shrubs, and herbage of the district. Farmers are reminded that the Department is always willing to report on any specimens of trees, shrubs, and other plants sent in for identification.—ED.

Sterculia diversifolia, Narrow-leafed Currajong. Eaten greedily by cattle, sheep, and horses. If fed to cattle with little other fodder, it has a very loosening effect on the bowels.

Sterculia australe (syn. *S. Trichosiphon*), Broad-leafed Currajong. Also useful, but not as reliable as the above because it sheds all its leaves in winter.

Ehretia membranifolia. Very good cattle feed. Sheep also eat it. Here we call it "Applewood."

Bauhinia Hookerii and *Bauhinia Carronii*. Liked by cattle particularly. They lick up the fallen flowers of *B. Carronii*.

Bursaria incana, "Prickly pine." Good feed for horses, cattle, and sheep.

Ventilago viminalis, Supple-jack. Cattle are fond of this.

Geijera parviflora, Wilga. Eaten by sheep and cattle. This is in tree form, called here "tree wilga." We have a wilga that grows as a bush; stock will not touch it.

Acacia salacina, "Willow wattle," known as "mimosa." Cattle like it.

Alphitonia excelsa, "Red Ash." Sheep and cattle eat it.

Alstonia constricta, "Native Quinine." Eaten by cattle.

Santalum lanceolatum, Plum Tree, True Sandalwood. Both sheep and cattle eat it readily. Not common here.

Petalostigma quadriloculare, "Quinine Berry." Fair feed for sheep and cattle. Horses nibble at it a little.

Atalaya hemiglauca, "Whitewood." Known locally as "Dead Finish"; good sheep feed, not of much value for cattle, as the small twigs are not easily digested.

Pittosporum phillyræoides, "Cattle Bush." Eaten by cattle.

Erythrina vespertilio, "Corkwood." Eaten by both sheep and cattle.

Melaleuca, "Tea-tree." Eaten by sheep and cattle, but contains very little nourishment.

Capparis canescens, "Wild Pomegranate." Liked by cattle and horses.

Canthium oleifolium, "Myrtle." Cattle eat it if very hungry.

Grewia latifolia, Wild Date. Nearly all stock are partial to these plants. Horses prefer them when the leaves are a little dry

Acacia decora. Cattle will eat the blossoms in a very dry time. Not of much value.

Hovea longifolia. Very common among the hills. Sheep strip the boughs of their leaves when very hungry. Not considered of much value.

Celastrus bilocularis, "Big Holly." Good sheep and cattle feed—one of the best.

Acacia farnesiana, "Wait-a-while Bush." Very useful sheep feed.

Celastrus Cunninghamii. Stock keep this eaten down to small bushes. Horses are very fond of it.

Tribulus terrestris. Calthrops, "Bull-head," or "Goats-head," is our most useful weed. It is excellent cattle feed, and all stock, particularly cattle and sheep, eat the dry stems long after the plant appears dead, and thrive on them.

Trianthema decandra, "Hogweed," is the next in value. It is more popular when nearly dry than when green.

Boerhaavia diffusa, "Tar-vine," or "Wild Verbena," is another valued weed. Horses are very partial to this.

CROP PLANTING TABLES FOR QUEENSLAND.

NUMBER OF PLANTS REQUIRED TO PLANT AN ACRE OF GROUND AT GIVEN DISTANCES.

	Plants.		Plants.
3 in. × 12 in.	174,240	18 in. × 42 in.	8,297
6 in. × 6 in.	174,240	18 in. × 48 in.	7,260
6 in. × 9 in.	116,160	20 in. × 24 in.	13,068
6 in. × 12 in.	87,120	20 in. × 30 in.	10,454
9 in. × 9 in.	77,440	20 in. × 36 in.	8,712
9 in. × 12 in.	58,080	20 in. × 42 in.	7,467
12 in. × 12 in.	43,560	20 in. × 48 in.	6,534
12 in. × 15 in.	34,848	2 ft. × 2 ft.	10,890
12 in. × 18 in.	29,040	2 ft. × 3 ft.	7,260
12 in. × 24 in.	21,780	2 ft. × 4 ft.	5,445
12 in. × 30 in.	17,424	2 ft. 6 in. × 3 ft.	5,808
12 in. × 36 in.	14,520	3 ft. × 3 ft.	4,840
12 in. × 42 in.	12,446	3 ft. × 4 ft.	3,630
12 in. × 48 in.	10,890	3 ft. 6 in. × 3 ft.	4,148
15 in. × 18 in.	23,232	4 ft. × 5 ft.	2,178
15 in. × 24 in.	17,424	4 ft. × 6 ft.	1,815
15 in. × 30 in.	13,939	4 ft. × 8 ft.	1,361
15 in. × 36 in.	11,616	4 ft. × 10 ft.	1,089
15 in. × 42 in.	9,956	4 ft. × 12 ft.	907
15 in. × 48 in.	8,712	6 ft. × 6 ft.	1,210
18 in. × 18 in.	19,360	6 ft. × 8 ft.	907
18 in. × 24 in.	14,520	6 ft. × 10 ft.	726
18 in. × 30 in.	11,616	6 ft. × 12 ft.	605
18 in. × 36 in.	9,680		

The omission of the last figure will give the number required for 16 perches.

TABLE OF EQUIVALENT QUANTITIES OF MANURES.

Per Acre.	Per Square Perch, Approx.	Per Square Yard, Approx.
1 ton	14 lbs.	7½ ozs.
10 cwt.	7 ,,	3¾ ,,
5 ,,	3½ ,,	2 ,,
4 ,,	2¾ ,,	1½ ,,
3 ,,	2 ,,	1 ,,
2 ,,	1½ ,,	
112 lbs.—1 cwt.	11¼ ozs.	
84 ,,	8½ ,,	
56 ,,	5½ ,,	
28 ,,	2¾ ,,	

1 Dessert-spoonful equals about 1 oz.

SOUTHERN DISTRICTS.

Sowing and Planting Table for Farm and Market Garden Crops.

(This Table requires to be adapted to suit individual circumstances.)

Crop.	Purpose for which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
					Ft. In.	Ft. In.				
Arrowroot	Farina and pig food ..	Aug. to Oct.	..	..	5 0	2 0	Tubers or "bulbs" 10 to 12 cwt.	..	8 to 10	Suited only to coastal districts. Tropical and semi-tropical.
Artichoke (Jerusalem)	Market sale and pig food	Aug. to Oct.	Sept. to Oct.	..	3 6	1 6	4 to 5 cwt.	..	4 to 5	
Asparagus	Market sale	Aug. to Sept.	Sept.	..	4 0	1 6	7,260 roots	..	18	May also be propagated from seed sown thinly in drills and transplanted when large enough.
Barley, Cape and Skinless	Green feed	Mar. to June	Mar. to July	Mar. to June	..	..	1 bushel ..	1½ bushel ..	2 to 4	
Barley, Malting ..	Grain	..	May and June	May and June	..	..	1 bushel ..	1½ bushel ..	4½ to 5	
Beans, Broad ..	Market sale	May to June	Apr. to May	May to June	2 6	0 6	2 bushels ..	..	4½ to 5	
Beans, French ..	Market sale	Sept. to Apr.	Oct. to Mar.	Sept. to Mar.	2 6	0 6	35 lb. small 52 lb. large	seeded seeded	2½ to 3	Sowings may be made earlier and later, according to the district's susceptibility to frosts.
Beans, Lima ..	Bush	Sept. to Apr.	Oct. to Jan.	Sept. to Jan.	2 6	0 9	21 lb. small	seeded }	3½ to 4	
Do. do. ..	Runner	Sept. to Apr.	Oct. to Mar.	Sept. to Apr.	4 0	1 0	26 lb. large	seeded }		
Beet, Garden varieties	Market sale	Feb. to Apr.	Jan. to Mar.	..	2 0	0 9	4 to 5 lb. ..	..	3 to 4	
Beet, Spinach ..	Stock food	Apr. to June	Apr. to June	..	2 6	1 0	4 lb. ..	..	3 to 4	Foliage of Spinach Beet is reproduced quickly after being cut down and is a profitable crop for fattening purposes.
Broom Millet ..	Fibre for brushware ..	Sept. to Dec.	Oct. to Dec.	Oct. to Dec.	3 6	0 9	4 to 5 lb. ..	..	4½ to 5	
Buckwheat	Bees, green manure, grain, and poultry food	Sept. to Mar.	Sept. to Mar.	Sept. to Feb.	2 0	..	25 to 30 lb.	40 to 45 lb.	1½ to 2½	Produces a valuable nectar crop within 6 to 7 weeks of planting.
Cabbage	Market and cattle food	Nearly all seasons except summer	Nearly all seasons except summer	Nearly all seasons except summer	2 6	2 0	1 lb. ..	..	4 to 5	

Canary Seed	Hay and grain	..	May to June	May to June	..	..	15 lb.	..	4½ to 5	
Capsicum	Market sale	Aug. to Oct.	Sept. to Oct.	Sept. to Oct.	2 6	1 6	1 lb.	..	4 to 5	
Carrot, Field	Stock food	Mar. to June	Apr. to May	Mar. to June	1 9	..	2 to 3 lb.	..	4 to 5	
Carrot, Garden	Market sale	Nearly all seasons	Nearly all seasons	Sept. to May	1 6	..	2 to 3 lb.	..	4	
Cassava (Tapioca)	Starch or pig food	Aug. to Sept.	..	..	5 0	2 0	4,356 cuttings	..	8 to 10	Boil before using. The water in which roots are boiled should not be used.
Cauliflower	Market sale	Feb. and Apr.	Feb. to May	Feb. to Mar.	2 6	2 0	1 lb.	..	6	
Celery	ditto	Jan. to Mar.	Jan. to Mar.	..	4 0	0 6	4 oz.	..	5 to 6	
Chocos	ditto	Aug. to Oct.	..	..	Trellis	..	Chocos	..	4 to 5	
Cotton	Fibre	Sept. to Dec.	Sept. to Nov.	Sept. to Nov.	4 0	2 0	5 to 6 lb.	..	4 to 4½	Early cultivation is essential to keep down weeds and grass.
Cow Cane	Cattle food	Sept. to Dec.	..	..	5 0	1 6	5,800 sets	..	7 to 8	
Cowpea	Grain, hay, or green manure	Sept. to Jan.	Oct. to Jan.	Oct. to Jan.	3 0	0 8	10 lb.	15 to 20 lb.	4 to 4½	The non-running varieties are the most suitable for grain.
Cucumber	Market sale	Sept. to Jan.	Oct. to Jan.	Sept. to Jan.	5 0	2 0	1 lb.	..	3	
Egg Plant	ditto	Sept. and Oct.	Sept. and Oct.	Sept. and Oct.	3 0	3 0	1 oz. for 1,000 plants	..	6	
Garlic	ditto	Aug. to Sept.	Aug. to Sept.	..	1 6	0 6	..	..	6	
Ginger	ditto	Aug. to Sept.	..	..	3 0	1 0	5 to 6 cwt.	..	10	
GRASSES—										
Cocksfoot	Pasture	..	Apr. to May	..	..	..	..	1½ bushel		
Elephant Grass	Green fodder before the stems harden	Aug. to Oct.	..	..	5 0	2 6	(3,432 cuttings of stem	..	4 to 5	Can be cut at intervals during each season until unprofitable. Also propagated from seed.
Italian Rye Grass	Pasture	..	Apr. to May	..	..	..	..	2 bushels		
Paspalum	ditto	Sept. to Jan.	Sept. to Jan.	..	..	..	..	8 to 10 lb.	4 to 6	Sow in rainy season.
Perennial Rye Grass	ditto	..	Apr. to May	..	..	..	..	2 bushels		
Prairie	ditto	Apr. to May	Apr. to May	Apr. to May	..	..	..	1½ to 2 bus.	4 to 5	
Rhodes	ditto	Sept. to Jan.	Sept. to Jan.	Sept. to Jan.	..	..	..	4 to 5 lb.	4 to 6	Sow in rainy season.
HERBS—										
Lavender	Perfume	Aug. to Sept.	Aug. to Sept.	..	4 0	2 0	..	..	12	Propagated from seed or by division of rootlets.
Marjoram	Seasoning	Aug. to Sept.	Aug. to Sept.	Aug. to Sept.	2 6	0 6	..	..	3	Propagated from seed or by division of rootlets.
Mint	ditto	Aug. to Sept.	Aug. to Sept.	..	..	..	..	..	2	Propagated by rootlets only.
Parsley	ditto	Nearly all seasons	Nearly all seasons	..	2 6	..	1 lb.	..	2½ to 3½	

SOUTHERN DISTRICTS—*continued.*

Crop.	Purpose for which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
					Ft. In.	Ft. In.				
HERBS—*continued.*										
Sage	Seasoning	Aug. to Sept.	Aug. to Sept.	..	2 6	0 9	2 lb. ..	..	3	Propagated from seed or by division of rootlets.
Thyme	Seasoning	Aug. to Sept.	Aug. to Sept.	Aug. to Sept.	2 6	0 6	..	..	3	Propagated from seed or by division of rootlets.
Kale	Stock food	Feb. to June	Feb. to June	..	3 0	2 0	1 lb. ..	..	4	
Kohl Rabi	Market sale, stock food	Mar. to Apr.	Mar. to Apr.	..	2 6	1 6	2 lb. ..	..	4 to 5	
Leek	Market sale	Feb. to Apr.	Feb. to Apr.	..	2 6	0 6	2 lb. ..	..	6 to 8	Transplanted when the leeks are the size of goose quills.
Lettuce	ditto	All seasons ..	All seasons ..	..	2 0	0 9	½ lb. ..	..	3	During dry periods of year sow in drills and thin out.
Linseed (Flax) ..	Fibre and grain ..	May and June	May and June	..	Drilled	..	30 lb. for grain 60 lb. for fibre	..	4½ to 5	Can be treated as an ordinary white cereal crop and harvested with reaper and binder.
Lucerne	Fodder	April to May	April to May	..	Drilled	..	12 to 14 lb.	16 to 20 lb.	1½ to 2	First cutting should take place as soon as the plant will stand up to the mower and before it flowers.
Maize	Grain and silage ..	Aug. to Jan.	Sept. to Jan.	Sept. to Jan.	4 0	1 3	8 to 10 lb.	..	4 to 5	If sown on the "check row" system weeds are more easily dealt with.
Mangel and Sugar Beet	Stock food	Feb. to Apr.	Mar. to June	..	2 6	1 0	5 to 7 lb.	..	6 to 7	
Marrow, Vegetable ..	Market sale	Aug. to Jan.	Sept. to Jan.	Sept. to Jan.	4 to 8 feet	4 0	2 lb. ..	..	3 to 4	Distance apart and time of maturing according to variety grown.
Melon, Rock ..	ditto	Aug. to Jan.	Sept. to Dec.	Sept. to Dec.	4 to 6 feet	2 0	1 lb. ..	..	3	Distance apart and time of maturing according to variety.

Melon, Water ..	Market sale	Aug. to Jan.	Sept. to Jan.	Sept. to Jan.	4 to 6 feet	2 0	2 lb. ..	..	3 to 4	Distance apart and time of maturing according to variety.
Millet, Foxtail varieties, these include the so-called Giant Panicum	Fodder	Sept. to Jan.	Oct. to Jan.	Sept. to Jan.	Drilled	..	10 to 14 lb.	..	2	Should be cut for hay before the seed forms.
Millets, French ..	Grain and green fodder	Sept. to Jan.	Sept. to Jan.	Sept. to Jan.	Drilled	..	7 to 8 lb. ..	..	1½ to 2	A useful catch crop.
Mustard	Market sale	All seasons ..	All seasons ..	..	Sown in beds for salad use			..	..	For farm use, see remarks under Rape.
Oats	Grain and fodder ..	Apr. to June	Apr. to June	Apr. to June	Drilled	..	1½ bushel ..	1½ to 2 bus.	3 to 5	
Onion	Market sale	Apr. to May..	Mar. to Apr.	Mar. to Apr.	1 0	..	4 lb. ..	..	5 to 6	
Panicum (White) and Japanese Millet	Silage, fodder, and grain	Aug. to Feb.	Sept. to Feb.	Sept. to Feb.	Drilled	..	10 to 14 lb.	..	2	Should be cut for hay before the seed forms.
Parsnip	Market sale	Feb. to Mar.	Feb. to Mar.	..	2 0	..	1 lb. ..	..	6 to 7	
Pea, Field	Fodder	Mar. to June	Mar. to June	Apr. to June	2 0	..	½ to ¾ bus.	..	4 to 5	Usually combined with a cereal fodder crop.
Pea, Garden	Market sale	Feb. to Sept.	Mar. to Sept.	Mar. to June	2 0	..	1½ bushel ..	..	3½ to 4	Period of maturity according to variety used.
Peanut	ditto	Aug. to Jan.	Sept. to Dec.	Sept. to Dec.	3 0	1 3	30 to 35 lb.	..	5	
Potato	ditto	Aug. and Feb.	Aug. and Feb.	..	2 6	1 0	8 to 9 cwt.	..	3 to 4	
Potato, Sweet ..	ditto	Aug. to Jan.	Sept. to Jan.	Sept. to Jan.	3 to 3½ feet	1 6	9,000 cuttings	..	3 to 4	
Pumpkin	Fodder and market sale	Aug. to Jan.	Sept. to Jan.	Sept. to Jan	8 to 10 feet	3 0	2 lb. ..	..	5 or 6	Distance apart and time of maturing varies according to variety.
Radish	Market sale	Nearly all seasons	Nearly all seasons	Nearly all seasons	1 0 apart	..	10 to 12 lb.	..	1½	
Rape	Fodder and green manure	Mar. to May	Mar. to May	..	Drilled	..	5 to 6 lb. ..	..	2½ to 4	The addition of 1 lb. of mustard seed to every 5 or 6 lb. will, if sown in conjunction, minimise the tendency of depastured animals to bloat.
Rhubarb	Market sale	Aug. to Oct.	Sept. to Nov.	..	4 0	4 0	1½ lb. ..	..	4 to 5	When propagated from roots quicker returns may be expected.
Rice, Upland ..	Grain and fodder ..	Oct. to Jan.	..	..	Drilled	..	12 to 16 lb.	..	4 to 5	
Rosella	ditto	Aug. to Nov.	Sept. to Oct.	..	4 0	3 0	Sow in beds and transplant	..	3 to 4	
Rye	Fodder	Mar. to June	Apr. to June	Apr. to June	Drilled	..	¾ to 1 bushel	..	3 to 5	

SOUTHERN DISTRICTS—*continued.*

Crop.	Purpose for which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
					Ft. In.	Ft. In.				
Shallots	Market sale	Nearly all seasons	Nearly all seasons	..	1 6	0 6	..	..	3 to 4	Propagated by division of the bulbs.
Sorghum, Feed	Fodder and silage	Aug. to Feb.	Sept. to Feb.	Sept. to Jan.	3 6	0 8	4 to 5 lb.	..	3½ to 5	Maturity depends on variety used.
Sorghum, Grain	Grain	Aug. to Feb.	Sept. to Jan.	Sept. to Jan.	3 6	0 8	3 to 4 lb.	..	3½ to 5	
Soudan Grass	Fodder or silage	Sept. to Feb.	Sept. to Jan.	Sept. to Dec.	2 6	..	3 to 4 lb.	..	2	Closer planting permissible.
Soy Beans	Grain	Sept. to Jan.	Oct. to Jan.	..	2 6	0 8	8 to 10 lb.	..	3	
Squash	..	*See* Marrows and Pumpkins.								
Swede	Market sale and stock food	Feb. to May	Feb. to May	..	2 0	1 0	2 lb.	..	4 to 5	
Sweet Corn	Market sale	Aug. to Jan.	Sept. to Jan.	..	3 6	1 3	8 to 10 lb.	..	3	
Tares	Fodder or green manure	Mar. to June	Mar. to June	..	Drilled	..	1 bushel	½ bushel to 1 bushel other grain	3 to 4	For fodder purposes is best used with some form of cereal, such as barley, wheat, or rye.
Tobacco	Leaf	Oct. to Jan.	Oct. to Feb.	Oct. to Jan.	4 0	1 ft. 8 in. to 2 ft.	1 oz. in seed beds	..	3 to 4	Plants must be raised in specially prepared seed beds and transplanted when strong enough to permanent positions.
Tomato	Market sale	Aug. to Feb.	Sept. to Jan.	Sept. to Jan.	4 0	2 0	¼ lb.	..	3 to 4	
Turnip, Field	Stock food	Feb. to June	Feb. to June	..	2 0	1 0	2 to 3 lb.	..	3 to 4	
Turnip, Garden	Market sale	Feb. to June	Feb. to June	..	2 0	0 6	2 lb.	..	2 to 3	
Wheat	Grain and hay	Apr. to May	Apr. to July	Apr. to June	Drilled	..	¾ bushel	1 bushel	3 to 4	Fodder purposes only on coast.

CENTRAL DISTRICTS.

Sowing and Planting Table for Farm and Market Garden Crops.

(This Table requires to be adapted to suit individual circumstances.)

Crop.	Purpose for which Grown.	When to Sow or Plant.		How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland and Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
				Ft. In.	Ft. In.				
Arrowroot	Farina and pig food	Aug. to Nov.	..	5 0	2 0	10 to 12 cwt.	..	8 to 10	Propagated by small "bulbs" or tubers.
Artichoke (Jerusalem)	Market sale and pig food	Aug. to Nov.	Sept. to Nov.	3 6	1 6	4 to 5 cwt.	..	4 to 5	
Asparagus	Market sale	Aug.	..	4 0	1 6	7,260 sets.	..	18	Propagated from seed or division of roots.
Barley (Cape and Skinless)	Green feed	Mar. to June	Mar. to June	Drilled	0 7	1 bushel	1½ bushel	2 to 4	
Beans, French	Market sale	July to Apr.	Sept. to Jan.	2 6	0 6	..	35 lb. small 52 lb. large	2 to 3	
Beans, Broad	ditto	May to June	..	2 6	0 6	2 bushels	..	4 to 5	
Beans, Lima	ditto	July to Jan.	Sept. to Dec.	4 0	1 0	26 lb. large seeded	..	3 to 4	
Beetroot	ditto	Feb. to Aug.	Sept. to Dec.	2 6	0 9	4 to 5 lb.	..	3 to 4	
Beet, Silver or Spinach	Market sale or stock food	All seasons	Apr. to June	2 6	1 0	4 lb.	..	3	Useful both as a vegetable and as a stock food.
Broom Millet	Fibre for brushware	Aug. to Jan.	Sept. to Dec.	3 6	0 9	4 to 5 lb.	..	4 to 5	
Buckwheat	Bees, green manure, poultry food, and grain	Aug. to Jan.	Sept. to Dec.	2 0	..	25 to 30 lb.	40 to 45 lb.	1½ to 2½	Produces a valuable nectar crop within 6 or 7 weeks of planting.
Cabbage	Market sale	Feb. to June	Feb. to June	3 0	2 0	1 lb.	..	4 to 5	
Canary Seed	Grain or hay	Mar. to June	Mar. to June	Drilled	..	15 lb.	..	4½ to 5	Also used as green stuff.
Capsicum	Market sale	Aug. to Nov.	Sept. to Nov.	3 0	2 to 3 ft.	1 lb.	..	4 to 4½	Distance apart according to variety.
Carrot, Field	Stock food	Mar. to June	Sept. to Jan.	1 9	..	3 lb.	..	4 to 5	
Carrots, Garden	Market sale	Mar. to June	Sept. to Jan.	1 6	..	3 to 4 lb.	..	3 to 4	
Cassava (Tapioca)	Starch or pig food	July to Sept.	..	5 0	2 0	Cuttings	..	8 to 10	Boil before using. The water in which roots are boiled should not be used.
Cauliflower	Market sale	Feb. to May	Feb. to May	3 0	2 0	1 lb.	..	5 to 6	
Celery	ditto	Feb. to Mar.	Feb. to Mar.	4 0	0 6	4 oz.	..	6	
Chocos	ditto	July to Nov.	Sept. to Nov.	Trellis	6 0	..	..	4	

CENTRAL DISTRICTS—*continued.*

Crop.	Purpose for which Grown.	When to Sow or Plant.		How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland and Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
				Ft. In.	Ft. In.				
Cotton	Fibre	July to Oct.	Sept. to Oct.	4 0	2 to 3 ft.	5 lb.	..	4 to 5	
Cow Cane	Cattle food	Sept. Oct. and in Mar.	..	5 0	1 6	5,800 sets	..	7 to 8	
Cowpea	Hay or green manure	Aug. to Feb.	Sept. to Jan.	3 0	0 8	9 to 10 lb.	15 lb.	4 to 4½	
Cucumber	Market sale	July to Jan.	Aug. to Dec.	4 0	2 0	1 lb.	..	3	
Egg Plant	ditto	July to Oct.	Aug. to Oct.	3 0	1 6	..	1 oz. for 1,000 plants	6	
Garlic	ditto	Mar. to May	..	1 6	4 to 6 in.	..	..	6	
Ginger	ditto	Aug. to Nov.	..	3 0	1 0	5 to 6 cwt.	..	9 to 10	
GRASSES—									
Elephant	Green fodder, before the stems harden	Jan. to Mar. Aug. to Oct.	..	5 0	2 6	3,432 cuttings of stem	..	4 to 5	Can be cut at intervals during each season until unprofitable. (Also propagated from seed.)
Paspalum	Pasture	Aug. to Dec. Jan. to Mar.	..	..	..	..	8 to 10 lb.	4 to 6	Is established more readily in the wet season, Jan. to Mar.
Prairie	ditto	Mar. to Apr.	..	..	..	..	1½ bushel	4 to 5	Only suitable for localities favoured with winter rains.
Rhodes	ditto	Aug. to Dec.	..	..	..	..	4 to 5 lb.	4 to 6	Seed germinates readily in the wet season, Jan. to Mar., and in cloudy weather.
Kohl Rabi	Market sale	Mar. to May	..	2 6	1 6	2 lb.	..	3 to 4	
Leek	Domestic use	Mar. to May	..	2 6	0 6	2 lb.	..	6 to 8	
Lettuce	Market sale	Mar. to Sept.	..	2 0	0 9	½ lb.	..	3	
Linseed (Flax)	Seed	Apr. to June	..	Drilled	..	25 to 30 lb.	..	4½ to 5	
Lucerne	Hay and green stuff	Apr. to June	..	Drilled	..	12 to 14 lb.	16 to 20 lb.	Perennial	
Maize	Grain and silage	Aug. to Jan.	Sept. to Dec.	4 0	1 3	8 to 10 lb.	..	4 to 5	For silage in forest country and in freshly cleared scrub lands, 10 to 15 lb. of seed per acre.
Mangel and Sugar Beet	Stock food	Mar. to June and in Aug.	Sept. to Oct.	2 6	1 6	5 to 7 lb.	..	6 to 7	

Marrow, Vegetable ..	Market sale	July to Mar.	Sept. to Jan.	4 to 8 ft.	3 0	2 lb. ..	..	3 to 4	Distance apart and time of maturing according to variety.
Melon, Rock ..	ditto	July to Sept.	Sept. to Oct.	4 to 6 ft.	2 0	1 lb. ..	..	3	Distance apart and time of maturing according to variety.
Melon, Water ..	ditto	July to Oct.	Sept. to Oct.	4 to 6 ft.	2 0	2 lb. ..	..	3 to 4	
Millet, Foxtail varieties, these include the so-called Giant Panicum	Hay and silage	Aug. to Jan.	Sept to Dec.	Drilled	..	10 to 14 lb.	..	2	Should be cut for hay before the seed forms.
Millets, French ..	Grain and green fodder ..	Aug. to Feb.	Sept. to Jan.	Drilled	..	7 to 8 lb. ..	..	1½ to 2	
Oats	Hay and green stuff	Apr. to June	Apr. to June	Drilled	..	1½ bushel ..	1½ to 2 bus.	4 to 5	
Onion	Market sale	Apr. to June	Apr. to June	1 0	0 4	4 lb. ..	..	6	
Panicum (White) and Japanese Millet	Silage, hay, and green stuff ..	Aug. to Feb.	Aug. to Feb.	Drilled	..	14 to 16 lb.	..	2	Should be cut for hay before seed forms.
Parsley	Market sale	Nearly all seasons	Nearly all seasons	2 6	..	1 lb. ..	..	2½ to 3½	
Parsnip	ditto	Mar. to Apr.	Mar. to Apr.	2 0	0 6	1 lb. ..	..	6 to 7	
Pea, Field	Fodder	Mar. to June	Apr. to June	2 0	..	½ to ¾ bus.	..	4 to 5	Invariably sown with a cereal, half bushel field pea, 1 bushel wheat, &c.
Pea, Garden	Market sale	Mar. to June	Apr. to June	2 0	..	1½ bushel ..	..	3½ to 4	Period of growth according to variety.
Peanut	ditto	Aug. to Nov.	Sept. to Nov.	3 0	1 3	30 to 35 lb.	..	5	
Potato	ditto	July and Feb.	Aug. and Feb.	3 0	1 0	8 cwt. ..	..	3 to 4	
Potato, Sweet ..	ditto	Aug. to Dec.	Sept. to Nov.	3 to 4 ft.	1 6	9,000 cuttings	..	3 to 4	
Pumpkin	Market sale and stock food ..	July to Nov.	Sept. to Nov.	8 to 10rt.	4 0	2 lb. ..	..	5 to 6	Distance apart and period of growth varies according to variety.
Radish	Market sale	All seasons ..	All seasons ..	1 0	0 3	10 to 12 lb.	..	1½	
Rape	Fodder and green manuring ..	Mar. to June	..	Drilled	..	3 to 4 lb. ..	6 to 8 lb. ..	4 to 5	Can be grazed off in 6 to 8 weeks. Should be sown with 1 lb. mustard to every 5 or 6 lb. or rape seed to prevent bloat.
Rhubarb	Market sale	Aug. to Sept.	..	4 0	4 0	Roots ..	..	2	
Rice, Upland ..	Grain or hay	Oct. to Dec.	..	Drilled	..	20 lb. ..	..	4 to 5	
Rosella	Market sale	Aug. to Oct.	..	4 0	3 0	..	..	3 to 4	
Rye	Fodder	Mar. to June	..	Drilled	..	¾ bushel ..	..	3 to 5	
Shallot	Market sale	All seasons ..	All seasons ..	1 6	0 6	..	..	..	Propagated by division of the bulbs.
Sorghum, Feed ..	Fodder and silage	Aug. to Feb.	Sept. to Dec.	3 6	0 8	4 to 5 lb. ..	..	3 to 4	Period of growth varies according to variety.

CENTRAL DISTRICTS—*continued.*

Crop.	Purpose for which Grown.	When to Sow or Plant.		How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland and Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
				Ft. In.	Ft. In.				
Sorghum, Grain	Grain	Aug. to Feb.	Sept. to Dec.	3 6	0 8	4 lb.	..	4	Period of maturing according to variety.
Soudan Grass	Hay or silage	Aug. to Jan.	Sept. to Dec.	2 6	..	3 to 4 lb.	..	2 to 3	On clean land drills may be 14 in. apart, 8 to 9 lb. of seed being required.
Soy Beans	Grain	Aug. to Jan.	..	2 6	0 8	10 lb.	..	3 to 4	
Squash	..	..	..	..	..	*See* Marrows and Pumpkins.			
Sunflower	Grain	Aug. to Nov.	Sept. to Nov.	4 0	1 6	6 lb.	..	4 to 5	
Swede	Market sale and stock food	Mar. to June	..	2 0	1 0	2 to 3 lb.	..	3 to 4	
Sweet Corn	Market sale	Aug. to Jan.	Sept. to Jan.	3 to 4 ft.	1 0	8 to 10 lb.	..	3	Should be planted when the flowering season will not coincide with that of ordinary maize planted alongside.
Tares	Fodder or green manure	Mar. to June	..	Drilled	..	1½ bushel	½ bushel with 1 bushel cereals	4	
Tobacco	Leaf	Oct. to Jan.	Oct. to Feb.	4 0	1 ft. 8 in. to 2 ft.	1 oz. in seed beds	Transplanted	3 to 4	
Tomato	Market sale	All seasons	Aug. to Dec.	4 0	2 0	½ lb.	Transplanted	3 to 4	
Turnip, Field	Stock food	Mar. to June	..	2 0	1 0	2 to 3 lb.	..	3	
Turnip, Garden	Market sale	Mar. to July	..	2 0	0 6	2 lb.	..	2 to 3	
Wheat	Hay or green fodder	Apr. to June	Apr. to June	Drilled	..	1 bushel	1½ bushel	4 to 5	For costal districts, only rust-resisting hay wheats suitable.

NOTES ON NORTHERN SEED TABLES.

The Northern districts vary greatly in their rainfall; also in the quantities that fall in each month. Thus, on the coastal strip Mackay and Proserpine enjoy a greater and better distributed rainfall than Bowen, the lower Burdekin, and Townsville; while from Ingham through to Cairns much the heaviest rainfall in the State is experienced. Similarly, on the Tablelands certain areas, such as Ravenshoe, Millaa Millaa, and along the watershed of the Johnstone and Russell Rivers and near the crest of the coastal range, a much heavier and better distributed rainfall obtains than a little further back.

The inland districts are not so variable as the coastal areas in their periods and quantity of rainfall.

The compilation of the present table must be looked at as a general guide and sowings made with regard to the season generally experienced in a particular locality. Generally, crops are best planted at the commencement of the monsoonal rains or wet season, starting usually in November or December. Other plantings are made towards the close of the wet season or when extra heavy rains will not cause injury to the growing crop. When about to plant, growers should consider the month the crop is likely to be harvested and arrange accordingly.

In districts of heavy rainfall many root crops, even on well-drained land, are liable to rot out. In potato planting on the Tablelands and inland it is advisable to plant before the wet season commences. The tubers will make a certain amount of root-growth, and shoots will appear on the surface in a short time after the first shower. Growth is then rapid, and when the heavier rains fall the foliage can better cope with excess moisture. The crop planted before the wet season begins always gives a heavier yield and better tubers than one planted after it.

On the Tablelands another planting can be made in February or March. Seed grown from this crop can be held for planting the main crop in October.

It is well to note that whole sets are always preferable in North Queensland to cut tubers.

NORTHERN AND TABLELAND DISTRICTS.

Sowing and Planting Table for Farm and Market Garden Crops.

(This Table requires to be adapted to suit individual circumstances.)

Crop.	Purpose for which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
					Ft. In.	Ft. In.				
Arrowroot	Farina and pig food	Aug. to Nov.	Aug. to Jan.	Oct. to Jan.	5 0	3 6	2,000-2,500 sets	..	8 to 10	Fresh land should be planted each year.
Artichoke (Jerusalem)	Stock food	July to Aug.	July to Dec.	July to Dec.	3 6	1 6	4 to 5 cwt.	..	4 to 5	Difficult to store; will keep better in the soil.
Asparagus	Domestic use	..	Sept.	..	4 0	1 6	7,260 roots	..	..	Suited only to the Tablelands and comparatively cooler districts.
Barley, Cape and Skinless	Green feed	Mar. to May	Feb. to May	Feb. to Mar.	..	..	1 bushel	1½ bushel	3	
Beans, French	Market sale	Apr. to Aug.	Aug. to Apr.	Feb. to Aug.	2 0	0 6	1 qt. to 100 ft. of drill	..	2½ to 3	
Beans, Lima	ditto	Mar. to Apr.	Dec. to Jan.	Nov. to Jan.	4 0	1 3	26 lb.	..	4 to 5	Only advisable as a field crop where fine weather can be depended on for harvesting.
Beet, Silver or Spinach	Stock food	Mar. to Aug.	Feb. to Sept.	Feb. to July	2 6	..	4 to 5 lb.	..	3	
Beetroot	Domestic use	Mar. to Aug.	Feb. to Sept.	Feb. to July	2 6	0 9	4 lb.	..	3	
Broom Millet	Brushware	Feb. to Mar.	Dec. to Feb.	Dec. to Feb.	3 4	0 9	4 to 5 lb.	..	4	
Buckwheat	Fodder, grain, and green manure	..	Dec. to Apr.	Dec. to Apr.	2 0	..	25 to 30 lb.	40 to 45 lb.	1½ to 2½	
Cabbage	Market sale	Feb. to July	Jan. to Aug.	Jan. to Aug.	2 6 to 3 0	2 0	1 lb.	..	4	
Capsicum	Domestic use	July to Oct.	Sept. to Oct.	Sept. to Oct.	3 0	2 0	1 lb.	..	4 to 5	Where districts are free from frost these may be planted all the year round.
Carrots, Field	Stock food	..	Feb. to Aug.	Feb. to Apr.	2 0	..	3 to 4 lb.	..	4 to 5	
Carrots, Garden	Market sale	Feb. to Oct.	Feb. to Oct.	Feb. to Oct.	1 6	..	4 lb.	..	4	

Cassava (Tapioca) ..	Starch, or pig food ..	July to Sept.	Sept. to Oct.	..	5 0	2 0	4,356 cuttings	..	8 to 10	Boil before using. The water in which roots are boiled should not be used.
Cauliflower	Market sale	..	Jan. to Mar.	Jan. to Feb.	3 0	2 0	1 lb. ..	..	5 to 6	
Celery	Domestic use	..	Jan. to Mar.	..	4 0	0 6	4 oz. ..	..	5 to 6	
Chocos	Market sale	July to Oct.	..	..	Trellis	6 0	..	..	4 to 5	
Cotton	Fibre	July to Oct.	Sept. to Oct.	Sept. to Oct.	4 0	2 0 to 3 0	5 to 6 lb. ..	..	4 to 5	
Cow Cane	Fodder	Oct. to May	Oct. to May	Oct. to Apr.	5 0	2 0	..	4,356 sets..	7 to 8	
Cowpea	Fodder and green manure	Aug. to Jan.	Sept. to Jan.	Nov. to Feb.	3 0	..	10 lb. ..	15 to 20 lb.	4½	
Cucumber	Market sale	Nearly all seasons	Nearly all seasons	..	5 0	2 0	1 lb. ..	..	3	Where districts are free from frosts these can be planted all the year round.
Egg Plant	Domestic use	July to Oct.	..	..	3 0	3 0	1 oz. for 1,000 plants	..	6	
Garlic	Market sale	Mar. to May	Aug. to Sept.	..	1 6	0 6	..	..	6	
Ginger	ditto	Aug. to Nov.	Oct. to Jan.	Oct. to Jan.	3 0	1 0 to 1 6	5 to 6 cwt.	..	10	
GRASSES—										
Elephant	Green fodder before the stems harden	Aug. to Oct.	Aug. to Oct.	..	5 0	2 6	3,432 cuttings of stem	..	4 to 5	Can be cut at intervals during each season until unprofitable (also propagated from seed).
Panicum muticum	ditto	Aug. to Oct.	Aug. to Oct.	..	6 0	6 0	Rootlets ..	..	4 to 5	
Paspalum ..	Pasture..	Early rains ..	Early rains ..	Early rains ..	..	..	..	8 to 10 lb.		
Prairie	ditto	..	Mar. to Apr.	..	..	..	..	30 to 40 lb.	4 to 5	
Rhodes	ditto	Early rains ..	Early rains or mid wet season	Early rains ..	..	..	..	4 to 5 lb. ..	4 to 6	Sow in rainy season.
HERBS—										
Lavender	Perfume	Mar. ..	Aug. to Sept.	..	4 0	2 0	..	..	..	Propagated from seed or by division of rootlets.
Marjoram ..	..	..	Aug. to Sept.	..	2 6	0 6	..	..	..	3 months from rootlets.
Mint	..	Aug. ..	Aug. to Sept.	..	..	..	..	..	..	
Sage	..	..	Aug. to Sept.	..	2 6	0 9	..	..	..	3 months from rootlets.
Thyme	..	..	Aug. to Sept.	..	2 6	0 6	..	..	..	3 months from rootlets.
Kohl Rabi	Market sale	Mar. to Apr.	Feb. to Apr.	Feb. to Apr.	2 6	1 6	2 lb. ..	..	4 to 5	
Leek	Domestic use	..	Feb. to Apr.	..	2 0	0 6	2 lb. ..	..	..	Suited only to the cooler districts of the North.
Lettuce	Market sale	..	Mar. to Sept.	..	2 0	0 9	½ lb. ..	..	3	
Linseed (Flax) ..	Grain	..	Jan. to Feb.	..	..	..	30 lb. ..	..	5	
Lucerne	Fodder	Mar. to Apr.	Feb. to Mar.	Feb. to Mar.	Drilled	..	12 to 14 lb.	16 to 20 lb.	Perennial	

NORTHERN AND TABLELAND DISTRICTS—*continued.*

Crop.	Purpose for which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance between Plants.	Quantity Seed per Acre if Drilled.	Quantity Seed per Acre if Broadcasted.		
					Ft. In.	Ft. In.				
Maize	Grain and silage	Aug. to Jan.	Nov. to Jan.	Nov. to Jan.	4 0	1 6	8 to 10 lb.	..	4 to 5	
Mangel and Sugar Beet	Stock food	..	Feb. to Mar.	..	2 6	1 3	5 to 7 lb.	..	6 to 7	
Marrow, Vegetable	Market sale	Sept. to Feb.	Nov. to Feb.	..	4 to 8 ft.	3 0	2 lb.	..	3 to 4	Distance apart and time of maturing according to variety.
Melon, Rock	ditto	Sept. to Feb.	Nov. to Feb.	..	4 to 6 ft.	2 0	1 lb.	..	3 to 4	Distance apart and time of maturing according to variety.
Melon, Water	ditto	Nov. to Feb.	Sept. to Dec.	Nov. to Dec.	4 to 6 ft.	2 0	2 lb.	..	3 to 4	
Millet, Foxtail varieties, these include the so-called Giant Panicum	Fodder	Jan. to Mar.	Aug. to Jan.	..	..	..	10 to 14 lb.	..	2	Should be cut for hay before the seed forms.
Millets, French	Grain	..	Aug. to Feb.	..	..	..	8 to 10 lb.	..	1½	
Oats	Green feed	..	Mar. to June	Feb. to Mar.	..	..	1½ bushel	1½ to 2 bus.	4 to 5	
Onion	Market sale	Mar. to May	Mar. to May	Mar. to Apr.	1 0	..	4 lb.	..	5 to 6	
Panicum (White) and Japanese Millet	Silage, hay, and green fodder	Mar. to May	Oct. to Mar.	Oct. to Mar.	..	..	14 to 16 lb.	..	2	
Parsley	Market sale	Mar.	Feb.	Feb.	2 6	..	1 lb.	..	2½ to 3½	
Parsnip	ditto	Feb. to Apr.	Jan. to Apr.	Jan. to Apr.	2 0	0 9	1 lb.	..	6 to 7	
Pea, Field	Fodder	..	Feb. to Apr.	Mar. to Apr.	2 0	..	½ to ¾ bus.	..	4 to 5	Usually combined with a cereal fodder crop.
Pea, Garden	Market sale	Mar. to May	Feb. to June	Mar. to May	2 0	..	1½ bushel	..	4	Period of maturing according to variety.
Peanut	ditto	Nov. to Mar.	Nov. to Feb.	Nov. to Feb.	3 0	1 3	30 to 35 lb.	..	5	
Potato	ditto	Mar. to May	Oct. to Dec. / Feb. to Mar.	Oct. to Dec. / Feb. to Mar.	3 0	1 0	8 cwt.	..	3 to 4	
Potato, Sweet	ditto	Aug. to Jan.	Oct. to Feb.	Oct. to Feb.	3 to 3½ ft.	1 6	9,000 cuttings	..	3 to 4	
Pumpkin	Market sale and stock food	Mar. to Apr. and from Aug. to Nov.	Nov. to Feb.	Nov. to Feb.	6 to 8 ft.	3 to 4 ft.	2 lb.	..	5 to 6	Distance apart and period varies according to variety.
Radish	Market sale	Nearly all seasons	Nearly all seasons	Nearly all seasons	1 0	..	10 to 12 lb.	..	1½	

Rape	Fodder and green manure	..	Mar. to May	..	..	..	5 to 6 lb. ..	..	4 to 5	
Rhubarb	Market sale	Aug. to Sept.	Sept. to Nov.	Sept. to Nov.	4 0	4 0	1½ lb. ..	..	4 to 5	When propagated from roots quicker returns may be expected.
Rice, Upland ..	Grain	Sept. to Feb.	Oct. to Jan.	Oct. to Jan.	Drilled	..	12 to 16 lb.	40 to 50 lb.	4 to 6	Harvest when half seed head is yellow. Stack and thresh after 6 weeks.
Rosella	Market sale	Sept. to Dec.	Oct. to Dec.	Oct. to Dec.	3 to 4 ft.	3 0	..	..	3 to 4	
Rye	Fodder	..	Mar. to June	Mar. to May	Drilled	..	¾ to 1 bus.	..	4	
Shallot	Market sale	Nearly all seasons	Nearly all seasons	Nearly all seasons	1 6	0 6	..	..	3 to 4	
Sorghum, Feed ..	Fodder and silage ..	Nov. to May	Nov. to Mar.	Nov. to Feb.	3 6	0 8	4 to 5 lb. ..	..	3 to 4	
Sorghum, Grain ..	Grain	Nov. to May	Nov. to Mar.	Nov. to Feb.	3 6	0 8	3 to 4 lb. ..	..	4	
Soudan Grass ..	Hay or silage	Early rains ..	Early rains ..	Early rains ..	2 6	..	3 to 4 lb. ..	..	2	
Soy Beans	Grain	Aug. ..	Sept. to Jan.	Sept. to Jan.	2 6	0 8	10 lb. ..	..	3	
Swede	Market sale	Mar. to May	Feb. to May	Feb. to Apr.	2 0	1 0	2 to 3 lb. ..	..	4 to 5	
Sweet Corn	ditto	Aug. to Jan.	Nov. to Jan.	Nov. to Jan.	3 6	1 0	8 to 10 lb.	..	3	
Tares	Fodder or green manure	Same as Field Peas.	..	..	..	..	1½ bushel ..	½ bushel with 1 bushel of other grain	4	For fodder purposes it is best sown with some other form of cereal.
Tobacco	Leaf	Oct. to Jan.	Oct. to Feb.	Oct. to Jan.	4 0	1 ft. 8 in. to 2 ft.	1 oz. in seed bed	..	3 to 4	Seeds must be sown in specially prepared seed beds and transplanted.
Tomato	Market sale	Feb. to May	Nov. to July	Nov. to July	4 0	2 0	½ lb. ..	..	3 to 4	
Turnip, Garden ..	ditto	..	Feb. to May	..	2 0	0 6	2 lb. ..	..	2 to 3	
Wheat	Hay, or green fodder ..	..	Feb. to June	Mar. to May	Drilled	..	40 to 60 lb.	..	4 to 5	Fodder purposes only.

Answers to Correspondents.

Elephant Grass.

E.A.R. (Tamaree)—

The specimen is the Elephant Grass or Napier's Fodder, *Pennisetum purpureum*, cultivated in coastal Queensland and northern New South Wales as a fodder. It is readily propagated from seed, or by cuttings or divisions. Stock are very fond of it, but it is probably best fed chaffed or cut, but sometimes it is grazed over, particularly after a cutting, and is not known to possess any poisonous or harmful properties at any stage of its growth.

Stagger Weed.

G.B.S. (Eumundi)—

The specimen is *Stachys arvensis*, Stagger Weed, also commonly known as Wild Mint, but not to be confused with the weed responsible for the loss of travelling stock in the Pittsworth district about twelve or eighteen months ago. The present plant causes "shivers" or "staggers" in working horses and travelling stock, but ordinary paddock stock, such as dairy cows, calves, &c., apparently are unaffected by it, the animals having to be excited or driven to cause the symptoms to appear. As a matter of fact, dairymen generally regard the plant as quite a useful fodder. It is a very common winter weed in Queensland, and I should think that your suggestion of continual ploughing should eradicate it next year.

Quinine Tree.

"INQUIRER" (Brisbane)—

So far as we know the common Cinchona or Quinine tree is not growing at the present time in Queensland. Its cultivation, however, has recently been strongly recommended, and the Department of Agriculture and Stock is making inquiries. Until about 1880 the forests of Colombia, Equador, Peru, and Bolivia furnished most of the bark used in the production of Quinine. Now practically the whole supply is obtained from plantations in Java, India, Ceylon, and Madagascar.

The two species most commonly grown are *Cinchona ledgeriana* (Yellow Bark) and *C. succirubra* (Red Bark), but recently the Dutch in Java have made some very promising crosses. At one time the bark was shipped to Europe for the manufacture of quinine, but now the finished product is manufactured at or near the plantations. The cultivation, preparation of the bark, and manufacture are very technical processes, and it is rather difficult on this account to say that it would ever become a small man's industry.

Grass Tree.

F.G.M.—

The Grass Tree has been accused of poisoning stock on different occasions. In the swampy country between Brisbane and Gympie it has been stated that cattle eat the young flowering poles greedily and become affected with "staggers" in the same way as in "zamia" poisoning. Feeding tests, however, have always given negative results, and we are of opinion that it is more the class of country on which the stock are run than the Grass Tree itself which is the cause of the trouble. On better class, ridgy country, where stock eat Grass Tree very freely during dry periods, it is looked on —particularly the young flowering poles—as quite good fodder.

Green Manuring in Banana Groves.

J.D.B. (Buderim Mountain)—

Your request for an opinion as to whether the practice of growing "mulch beans" between banana rows with the idea of preventing soil erosion as well as providing humus and choking weed growth affects the principal crop is answered by the Fruit Branch as follows:—

"Green manurial crops, such as those mentioned, if not grown too close to the banana stools, are not likely to seriously retard the growth of the latter, and the practice is recommended. Sowings made about November and December will give advantages which far outweigh the slight influence the green crop is likely to have in retarding the growth of bananas."

Washing Soda Not a Fertilizer.

Newcomer (Ingham—

The Agricultural Chemist, Mr. E. H. Gurney, advises—Washing soda is sodium carbonate, containing water of crystallisation. Sodium carbonate is not a fertilizer, and should not be added to the soil, as in certain concentration it ruins the texture of the soil, causing it to puddle in wet weather and dry to a hard cement-like mass in dry weather. Further, sodium carbonate, when present in the soil to any extent, prevents plant growth.

Banana Growing at Bundaberg.

W. J. McC. (Townsville)—

Relative to your inquiry as to the suitability of dense wattle scrubland, with good though rather sandy soil, situated near Bundaberg, for banana-growing, it is suggested that your correspondent seek the advice of the Banana Board inspector in the Bundaberg district and whose headquarters are at Maryborough. He, no doubt, is well acquainted with the locality in which your correspondent proposes to plant the suckers she has asked you to supply.

Pig Research.

L.P.A. (Murgon)—

The Senior Instructor in Pig Raising (Mr. E. J. Shelton) advises:—

The finance required to cover erection of piggeries at the Animal Health Station has been provided by an organisation not directly associated with the Department, so that these funds will not be a call on the money provided by Parliament.

The piggeries erected at Gatton College for experiment purposes are still being used for that purpose, and a number of feeding tests, in which cotton-seed meal provided by the Cotton Board is being used, are providing very useful information, which will, in due course, be made available through the Cotton Board.

It is planned to carry out a variety of feeding trials at Yeerongpilly and to utilise meat meal as a substitute for skim milk, and also other concentrates in the feeding of pigs, with a view to supplementing the data on the use both of commercial foodstuffs and farm-grown crops in the production of pigs for the export trade.

Already preparation has been made for research work in the control of parasitic life in pigs, and, in this connection, it may interest the members of your Local Producers' Association to note that the work carried out along these lines by this Department has created widespread interest. The pig improvement scheme is a form of financial assistance for the purchase of better boars and sows, aiming at fostering the production of pigs for the export trade.

It is suggested that your secretary get in touch with Mr. J. A. Heading, of Murgon, a member of the Queensland Pig Industry Council, who would be able to give members much information relative to the work of the Pig Council and of the various schemes at present receiving attention in the interests of pig-raisers.

A Tropical Weed (*Gomphrena decumbens*).

O.L.H. (Mareeba)—

The specimen is *Gomphrena decumbens*, a common tropical weed of the Amaranth family. It is said to have first made its appearance in Queensland about Townsville some two or three years ago, when it came up where circus elephants had been feeding. It has now become very widely spread in the State, as we have seen it growing as far west as Torrens Creek and as far south as Brisbane. We have not heard a common name applied to it, but it belongs to a genus of plants some of the members of which are commonly referred to as Bachelor's Buttons. The plant should make quite a good fodder, and, though we have had no personal experience, we think stock would take to it readily enough.

Finger Cherry—A Dreaded Plant.

E.C.D. (Townsville)—

The specimen sent you from El Arish represents the Finger Cherry, *Rhodomyrtus macrocarpa*. As you know, this is one of the most dreaded plants in North Queensland, the fruit, if eaten in quantity, commonly causing permanent blindness.

Care of the Boar.

W.M., Degilbo.—

The Senior Instructor in Pig Raising advises.—With regard to the Berkshire boar, generally speaking we do not advocate the use of drugs or other artificial means of stimulation, for if the type of pig, the feeding and management is at fault, drugs will prove useless and expensive, and in any case their effect is usually only of a temporary nature. Such artificial stimulants do not enjoy a ready sale in the stock world in this country. It is advisable to keep the boar in a separate paddock from the sows and to allow them to run with him immediately after weaning and until they have had good opportunity for service. It is advisable to strictly limit the food of the boar in particular during this period (following flushing, if that has been practised), otherwise the boar may become too fat and lazy, and the sow may have so much feed that she cares for nothing else. It sometimes pays to run another boar in an adjoining yard (a good strong picket fence of course being necessary as subdivision fence), and in your case I would think this would be advisable, seeing that you intend running a number of sows.

It usually happens that comparatively thin boars and sows breed more freely than fat or heavily fed animals; hence strict control of food supply is essential. In your case, we would suggest the best plan would probably be to allow the boar to run with the sows for a month or two to compel him to take additional exercise and share food with the sows. In this way, if he is likely to breed at all, he would be encouraged so to do; overfeeding has apparently affected his genitive capacity, and until condition is severely reduced, he is not likely to prove productive; and probably while this is being done, another more active boar would have sired a dozen or more litters, and be in first-rate breeding condition. It is useless carrying stock that will not breed. In this regard, perhaps, the Berkshire breed has suffered more than any other from forcing for show purposes; in fact, some strains are practically useless. Our general advice would be to dispose of slow breeders and introduce more active strains and push on with a fresh breeding policy. In this direction the Department is willing to help you through the Pig Improvement Scheme.

General Notes.

Citrus Industry.

Referring to the citrus industry in Queensland, the Minister for Agriculture and Stock, Mr. F. W. Bulcock, M.L.A., stated recently that the production of fruit was at present equal to about 75 per cent. of the consumption, and we were fast approaching the stage when it would be necessary to find extra markets for a surplus.

In order to avoid the undesirable position which existed in other States and in various parts of the world, where there was a big production of common oranges not up to export quality, it was his intention to set up a standard of the best varieties of oranges, mandarins, grape fruit, and lemons, and the intending planters of citrus trees would be recommended to make a selection of these varieties. In order further to ensure that only the best trees were supplied by nurserymen to intending planters, a scheme initiated by Mr. H. Barnes, Acting Director of Fruit Culture, for the supply to nurserymen of citrus budwood selected under Departmental supervision from special trees displaying desirable characteristics of vigour, freedom from disease, and productivity of fruit true to type, was well in hand.

"It was very evident," added the Minister, "after a survey of the orchards in some districts, that in the past some nurserymen had not been too scrupulous in regard to the selection of budwood, and the result could be seen in the weak condition of many trees and their shy bearing habit, when they should be producing on an average four to eight cases per tree."

The Department had established, some time ago, a citrus budwood plot planted with trees worked with the very best of budwood, but, as it would necessarily be several years before the trees would be large enough to supply all the budwood required, in the meantime the best trees that could be found had been selected from which to obtain budwood.

Another matter which was receiving consideration was that of seed selection for the growing of stocks. At present some nurserymen selected their seed from the most convenient sources. It was realised that this method often resulted in weak stocks incapable of producing a root system of sufficient strength to support a good tree. A search was being made by officers of the Department for vigorous-growing seedling trees of both orange and rough lemon which were recognised as bearing the most suitable seed for the growing of stocks.

Staff Changes and Appointments.

Messrs. J. D. Hynes, of Mingoola, and K. V. Doherty, of Maryvale, have been appointed Acting Inspectors of Stock.

Sergeant C. W. Watson, Stanthorpe, and Constable A. C. J. Arndt, Tinana, have been appointed also Inspectors under the Slaughtering Act.

Messrs. H. C. Stubbs, E. E. Jensen, C. G. Chick, and G. Tulloch, banana-growers in the Lower Tallebudgera Creek area, have been appointed Honorary Inspectors under the Diseases in Plants Acts.

Messrs. V. G. Tredwell, J. J. Turner, J. E. Dolan, E. N. Greaves, and J. J. Tracey, banana-growers in the Upper Currumbin area, have been appointed Honorary Inspectors under the Diseases in Plants Acts.

Mr. E. R. Ashburn, who previously held the position of manager of the State Farm at Gindie, has been appointed Instructor in Agriculture, Department of Agriculture and Stock.

The Council of Agriculture.

An Order in Council has been issued under the Primary Producers' Organisation and Marketing Acts declaring that the number of members of the Council of Agriculture shall be twenty-seven.

The Acts provide that the Council shall consist of the Director of Marketing, representatives of Commodity Boards, the Committee of Direction of Fruit Marketing, and the State Wheat Board, also one representative for each of the nine districts embracing Local Producers' Associations.

Regulations have been approved which prescribe the nine districts which embrace Local Producers' Associations. Briefly, these are Central Queensland, the Burnett, South Burnett, Wide Bay, East Moreton, West Moreton, the Darling Downs, the Western Downs, and the Atherton Tableland. The Regulations also empower the Governor in Council to appoint one representative for each of the districts mentioned.

Provision is also made for the appointment, at the annual meeting of the Council of Agriculture, of an Executive Committee consisting of not more than ten members. The Committee shall include the President, Vice-President, Director of Marketing, two representatives of the Butter Board, and two representatives selected by and from amongst all representatives of the Council with the exception of the district representatives, and three representatives selected from amongst the nine district representatives. Such Executive Committee shall hold office until the next annual meeting of the Council, and any vacancy which may arise therein on account of the death or resignation of any member other than the President, Vice-President, or Director of Marketing, may be filled by the Council by the appointment of some person selected in the same manner as the person dying or resigning was selected. The Council may delegate to the Executive Committee such powers by resolution as seem to the Council to be desirable.

A special Regulation has been issued prescribing the members of Commodity Boards who shall be members of the Council, and these include two representatives of the Butter Board (J. McRobert, of Maryborough, and W. J. Sloan, of Malanda), one representative of each of the remaining Boards (H. T. Anderson, Biddeston—Cheese Board; J. Beck, Stanwell—Cotton Board; W. Bailey, Atherton—Atherton Maize Board; C. Brumm, Woongoolba—Arrowroot Board; N. J. Christiansen, Wooroolin—Peanut Board; C. W. Edwards, Kingston—Honey Board; H. Kessler, Camboonya—Barley Board; A. McLauchlan, Boonah—Egg Board; H. Niemeyer, Hatton Vale—Broom Millet Board; G. D. O'Neill, Allora—Canary Seed Board; H. T. Skennar, Malanda—Northern Pig Board; W. Ranger, Brisbane—The Committee of Direction of Fruit Marketing; G. Johnson, Mackay—The Queensland Cane Growers' Council; and W. J. Brimblecombe, Pirrinuan—Wheat Board).

The above members are those who have been previously elected by the respective Commodity Boards, and shall be members of the Council of Agriculture pending the election of members of Commodity Boards to be members of the Council, as provided by the Acts.

The Governor in Council has appointed the following representatives of Districts Nos. 1 to 9, embracing Local Producers' Associations, to be members of the Council of Agriculture:—

	District.
J. E. Harding (Dalma Scrub) ..	No. 1, Central Queensland
V. Baker (Gayndah)	No. 2, The Burnett
W. L. Osborne (Wondai)	No. 3, South Burnett
E. Brabiner (Green's Creek, Gympie)	No. 4, Wide Bay
C. Bateman (Woodford)	No. 5, East Moreton
W. A. Fielding (Blenheim)	No. 6, West Moreton
J. Buckley (Rose Hill)	No. 7, Darling Downs
W. E. Ashford (Hannaford) ..	No. 8, Western Downs
J. Gargan (Atherton)	No. 9, Atherton Tableland

Cheese Board.

The Order in Council governing the election of members to the Queensland Cheese Board has been amended so as to conform with changes of ownership that have taken place in the various cheese factories operating throughout the State.

In the past, under "*The Regulation of Sugar Cane Prices Acts,* 1915 *to* 1931," members of Local Sugar Cane Prices Boards have been removed from office at the time when nominations for a new Board close. This meant that there was no Local Board operating from about the end of January until the gazettal of the new Board in April. A Regulation under the abovenamed Acts has now been passed whereby it is provided that members of each Local Board, other than the chairman, shall vacate office on the day preceding the date fixed for the taking of the poll for the election of the next succeeding Local Board.

Mange Cure for Dogs.

We are frequently appealed to for a remedy for dogs affected with mange. We recommend the following, which we have found very effective in almost every case where it has been applied in time. Don't wait until the dog is hopelessly affected become commencing treatment.

Wash affected parts with soft soap and warm water an hour before applying.

Apply 1 dr. creosote. 1 dr. liquor of potassa, 12 dr. olive oil. Repeat twice weekly.

Cheese Board.

The following nominations have been received at the Department of Agriculture and Stock in connection with the election of five growers' representatives on the Cheese Board for a term of one year:—Divisions 1, 2, and 3: Thomas Dare, Narko, Henry T. Anderson, Biddeston, and Alfred J. Harvey, Pittsworth, all returned unopposed. In Division 4 Mr. David G. O'Shea, the present member, is opposed by Mr. A. G. Tilley, of Rosenthal, Warwick, and voting-papers will be sent to the suppliers concerned within the next few days. Mr. Arthur Pearce, Coalstoun Lakes, has been returned unopposed for Division 5.

As 10 per cent. of the suppliers did not petition for a poll, the operations of the board will be continued for a further term of one year as from the 1st August.

Stock Disease Remedies—Warning to Stockowners.

In a statement which has been issued by the New South Wales Minister for Agriculture, a note of warning is sounded, in the interests of stockowners throughout that State, with regard to the action of vendors of certain proprietary remedies for different stock diseases. The statement is of equal interest to Queensland stockowners.

In connection with vaginitis it is pointed out that in a notice which recently appeared in a country newspaper over the name of a representative of a company handling a certain specific for the treatment of this disease, it was, in effect, claimed that vaginitis was the cause of sterility and abortion in cows, and an offer was made to inspect herds gratuitously and explain the disease to stockowners. While this disease does lead to temporary sterility, it is pointed out by the Chief Veterinary

Surgeon of the New South Wales Department that all available evidence is opposed to the theory that vaginitis is the cause of abortion, and the observations of competent and reliable investigators in Europe and Great Britain confirm the departmental viewpoint in this regard. In view of the inaccuracy, according to present scientific knowledge, of the opinion expressed in the notice referred to, farmers will readily be able to assess for themselves the value of any explanation that might be offered in regard to this disease by the person concerned.

Instances have come under notice, the Minister explains, where, although a preparation may contain constituents which it is recognised are beneficial for the treatment of a certain disease, the price charged is altogether disproportionately high in comparison with the actual cost of the constituents. In one such case a preparation was reported to be selling at over £2 for a tin containing less than a pound of the mixture, whereas the cost of the constituents would probably amount to less than 1s. per lb.

Other instances have come under notice where farmers' herds have been inspected, and treatment recommended for vaginitis, by persons who it is believed have had little or no training in connection with diseases of stock. In one case, cows were examined by means of an instrument, and it is understood that no precaution was taken to sterilise the instrument before using it on each individual animal, with the result that a grave risk was run of spreading any disease that might possibly have been present. Another objectionable practice which has been reported is that of vendors of specifics of this nature, after inspecting the stock and diagnosing the trouble according to their own viewpoint, endeavouring to induce the stockowner to accept the treatment they are canvassing, by forwarding the material or leaving it with the stockowner despite protests from the latter.

The Minister advises stockowners to be on the alert so as to avoid being imposed upon by unscrupulous individuals in connection with the treatment of stock diseases, and he urges that before allowing persons of whom they have no knowledge to conduct examinations of their cattle, farmers should be particularly careful to satisfy themselves that these individuals possess the proper qualifications which would enable them to take precautions against the spreading of infection. In conclusion, he states that, in accordance with a resolution adopted at the conference of Ministers of Agriculture recently held in Sydney, draft legislation is being prepared, for consideration, to regulate the sale of stock medicines, vaccines, stock licks, and patent stock foods.—A. and P. Notes, N.S.W. Department of Agriculture.

Soil Erosion in Dairying Districts—Prevention by Contour Draining.

Soil erosion was causing the loss of considerable areas of good lands in New South Wales, said the Senior Experimentalist of the New South Wales Department of Agriculture in the course of a recent address to South Coast dairy farmers, and as an indication of the enormous damage that might be done if preventive measures were not adopted instanced the total loss in America of 30,000,000 acres of their best lands and the partial loss of another 60,000,000 to 70,000,000 acres.

The far South Coast was subject to erosion, as it was largely of a hilly nature, and a good deal of cultivation was undertaken on this hill country. Once the surface soil was washed away the damage could not be repaired, and although the signs of erosion might not yet appear to be very serious, now was the time to commence the work of putting in contour banks to prevent development of the trouble. The banks, it was explained, had a fall of 6 to 9 inches in every 100 feet, and conveyed the run-off water across the slopes and allowed it to be disposed of wherever convenient. It was surprising, said the speaker, how, after contour draining, much of the water soaked in instead of running off as previously. This was an added advantage. For detailed directions concerning the method of marking out and constructing the banks, reference should be made to the free leaflet on the subject obtainable from the Department.

Rocks, timber, and other obstructions were likely to hamper operations on coastal lands, but farmers should not be discouraged by such difficulties, nor should any farmer imagine that his particular farm was too steep or the slopes too complicated to treat in the manner suggested. The only cases that presented real difficulties were those where steep land higher up (perhaps owned by another farmer) caused a run-off that washed the land lower down the slope.

In timber-strewn and rocky country, a single furrow on the contour line would suffice in many cases. In any case, as the contour banks on grazing country had not to be crossed by cultivating machinery, there was no necessity to build them quite so wide or high as on cropping land, for once they were constructed and grassed over, the crown of the bank was never again seriously disturbed, and consequently very little maintenance was required, it being only necessary to prevent rubbish blocking up the drain on the top side. Moreover, as only small banks were needed on grazing country, they could with advantage be placed closer together.

Oil-engine Fumes cause Second-grade Cream.

Where oil engines are installed on the dairy farm there is always a danger of the milk or cream becoming adversely affected by absorbed odours. Kerosene or crude oil engines are worse in this respect than benzine engines, but it is only a degree of taint that divides one from the other. Faults arising from absorbed oil or benzine fumes are a frequent cause of second-grade cream.

For this reason all oil or benzine engines must be installed apart from where the milk vat and separator are situated. Exhaust fumes from engines must, in all cases, be carried away from the buildings in order that the prevailing winds do not blow them back through ventilators or other openings into the separator room. Care must be taken where the water from the roof of the dairy premises is conserved that the exhaust does not blow on to the roof, or the water will be tainted.

Banana By-Products and Dehydrated Vegetables.

The Minister for Agriculture and Stock (Hon. F. W. Bulcock, M.L.A.) stated recently that from time to time inquiries are made regarding the potentialities of markets overseas for banana by-products and dehydrated vegetables. Cables had been sent to the Agent-General for Queensland in London, with a view to ascertaining the demand in other countries, and he had received advice which indicated that there did not appear to be a prospect of any remunerative business in the lines mentioned, except, perhaps, with Germany.

There was practically no demand in the United Kingdom, stated Mr. Bulcock, for either banana flour or dried vegetables. Adequate supplies of fresh vegetables were available, and naturally people preferred the fresh article. Consignments had been received periodically from Holland and elsewhere, but sales proved very unsatisfactory. Small quantities were sold for use on tramp and cargo vessels and for export to tropical countries. Banana chips in moderate quantities were purchased at ruling continent prices of £8 to £9 per ton, subject to arrival in good condition.

If Queensland manufacturers consider they could compete at this figure, it would be advisable, first of all, to submit samples for comparison of quality with that of other countries.

The demand for banana flour in France was limited, and there was no immediate prospect of an expansion. Large stocks were on hand at various parts, and the agents were unable at the present moment to dispose of them. Australia had no trade agreement with France, and therefore any of our goods and products were subject to the French general tariff. It would, therefore, be difficult to compete with importers of banana flour from the French colonies. Dried vegetables were unknown on the French market, and it would therefore be necessary to submit samples, together with the best prices and quantities offered. The most important manufacturer of powdered soups in France bought up all the fresh vegetables necessary direct from the growers at very low cost, and if dried vegetables were offered they would have to be quoted at a very low price.

Germany appears to offer a possible market for banana chips for the manufacture of flour. The duty on the flour itself renders import prohibitive. In 1932 Germany imported 113,000 tons of dried bananas, which were consumed by the German milling industry in the production of banana flour. There has, however, been latterly a big decline in the price of banana chips, the present price being 50 phennige (6d.) per kilogramme (2 lb.). The chief use for banana flour is in the form of banana cocoa, and it is stated to be used extensively in the manufacture of cocoa and in the preparation of foodstuffs and of patent foods for children. A certain amount of business is done with dried vegetables, but in this case also it would be necessary to submit samples and the best possible prices before making any shipments.

Young Farmers' Club.

The success attending the formation of pig, calf, and other clubs in Australia, and particularly in New South Wales and Queensland, is but another evidence of the popularity of this movement throughout the world. Writing a few weeks ago, the Secretary of the National Federation of Young Farmers' Clubs in England, in extending season's greetings to Australian club members, advised that they were very gratified to receive the good wishes of members in this country which had been conveyed by the writer of these notes. British club members look forward to the day when these good wishes may be exchanged personally between representative teams of Australian and British members. Club members in New Zealand had also expressed the hope of a closer relationship between members in the other dominions, the Commonwealth, and the Homeland.

The conditions under which members work vary considerably in different countries, but all have the same object in view. The movement in England is making steady progress, proved by the fact that, in the last year, the total number of clubs has increased by 50 per cent.; a remarkable feature has been the greatly increased number of agricultural show societies, which have offered facilities to young farmers' clubs, either to show their stock or to enter stock judging competitions in which American and Canadian club members co-operate wholeheartedly, and send selected teams to Great Britain each year. Such events have aroused considerable interest and very favourable comment on the quality of the stock shown and on the practical capabilities of the young judges.

Is it too much to hope that an Empire Competition may be inaugurated or that one day Australia will send a team to the Young Farmers' International Judging Competitions at the Royal Show in England An exchange of visits on these lines would be something which those participating would remember all their lives. In these days of Empire travel it should not be impossible to arrange.

In conclusion, the Federation of Young Farmers in Great Britain desired to convey to overseas kinsmen and kinswomen a message of friendship, and to express the hope that members may always work towards a closer co-operation.

Tobacco Export Trade.

The Minister for Agriculture and Stock (Mr. F. W. Bulcock, M.L.A.) is in receipt of a report from the Acting Agent-General for Queensland (Mr. L. H. Pike) on two small consignments of tobacco leaf shipped to England in November last by the Department of Agriculture and the Mareeba Chamber of Commerce respectively. The primary object of the despatch of these consignments, which were representative of flue-cured tobacco leaf produced in Central and Northern Queensland, was to ascertain the prospects of securing an export market in the United Kingdom for Queensland tobacco.

In all samples examined and analysed, the leaf showed good combustion, but the flavour, although mild, was not satisfactory in the opinion of the manufacturers. The chemical examination and smoking trials indicated that the districts in which the leaf was grown were suitable for the cultivation of the type of tobacco examined, and the coarseness observed on smoking could probably be obviated by more satisfactory curing. Probably all the tobacco represented by the samples could be used for blending purposes in cigarette manufacture, but the report suggested that an article made entirely of the leaf would probably not appeal to the public taste. It was suggested that further quantities of tobacco, or, if possible, trial bales, might be forwarded to London to test the market, as the judgment pronounced on such small samples as those despatched could not be taken as final.

The Acting Agent-General supplied the rates of duty on unmanufactured tobacco in the United Kingdom, as follows:—

	Full. Per. lb.	Preferential. Per lb.
If unstripped—	*s. d.*	*d.*
Containing 10 lb. or more of moisture in every 100 lb. weight	9 6	7.5½
Containing less than 10 lb. of moisture in every 100 lb. weight	10 6	8.2⅞

He pointed out that duties on stripped unmanufactured tobacco were practically the same, and thus gave a preference on Empire tobacco of higher moisture content of 2s. 0½d. per lb. He also pointed out that, by virtue of the agreement entered into at the Ottawa Conference, between the Governments of the United Kingdom and Southern Rhodesia, the above rates of preferential duties were secured for a period of ten years from the date of the agreement on 20th August, 1932. It was important to note that the preferential margin of duty does not benefit the Empire grower, otherwise than by enabling him more readily to secure a market in the United Kingdom. In effect, the tobacco manufacturer pays a lower price for Empire tobacco and passes on to the consumer a large part of the preference, thus enabling the Empire products to be sold at the lowest retail prices in Great Britain. It is conceivable that, had the tobacco manufacturer been forced to pass on the full amount of the preference to the grower, the market for Empire tobaccos in the United Kingdom would have been considerably restricted, as the American competition would have kept the Empire growers off the market to a very large extent.

To illustrate this more clearly, Southern Rhodesian leaf of bright Virginian type is being sold in the United Kingdom at prices ranging from 10d. to 1s. 6d. per lb. The manufacturer pays the duty, and, in effect, passes the whole of the preferential margin (say, 2s. 0½d. per lb.) or a large part of it on to the consumer, who buys Rhodesian tobacco in retail at from 7½d. to 1s. per ounce.

The consumption of Rhodesian tobacco in the United Kingdom increased by over 500 per cent. since 1926, and at present there are on the British market 270 pipe tobaccos and 85 brands of cigarettes, composed wholly or partially of Rhodesian leaf. These results have been achieved by the close study of special requirements of each market, and the supply of requisite types and qualities.

Although there are no immediate prospects of a satisfactory overseas market for our tobacco, the Acting Agent-General suggests that marketing conditions in the United Kingdom should be closely noted, so that at some future date full advantage might be taken of the knowledge and information gained when it is necessary to find an export market for surplus stocks of tobacco produced in Australia. This suggestion, said Mr. Bulcock, would receive the earnest attention of the Government.

Tully Canegrowers' Executive.

An amendment of the Queensland Cane Growers' Council Regulations of 1931 has been approved under the Primary Producers' Organisation and Marketing Acts. This provides for the deletion of such words as relate to the fees, allowances, and travelling expenses of the Tully River Central Mill Suppliers' Committee, and adds to the regulation containing the fees and expenses of District Cane Growers' Executives, particulars relative to such fees of the Tully River Central District Executive. The Tully River District Cane Growers' Executive was recently created by Order in Council.

The Red-backed Spider.

A wrong impression that the bite of a red-backed spider is "usually fatal when the venom was injected through a tender part of the skin" was corrected recently by the Director of the Queensland Museum (Mr. H. A. Longman), who has done great service to the community in accurately describing the insect and its characteristics in non-technical language. In response to a request from the "Brisbane Courier," Mr. Longman recently wrote:—

"This spider is found throughout Australia, New Zealand, the South Pacific Islands, India, Malaysia, Papua, and Eastern Arabia. It is locally known as the red-back, red-spot, red-striped, or jockey spider, and in New Zealand it is called the 'Katipo.' Its most distinctive feature is the red or orange strip running centrally down the upper surface of the abdomen, which is otherwise black. The oval body of this spider is distinctly smaller than a green pea, so the species is not a large one. It builds its web in dark corners, in old cans, among rubbish, or under sheltered stones. It has often been reported as haunting earth outhouses. There are a few cases of fatal consequences on record, however, and this spider is evidently our most notorious species. In the majority of cases of severe illness human beings were bitten when in outhouses. Medical aid should be obtained at the earliest opportunity. Female spiders may be sometimes seen with their globular case of eggs, and obviously these should be destroyed whenever possible."

The Symptoms.

Mr. Longman drew attention to an important article on the venom of the red-backed spider by Dr. C. H. Kellaway, M.C., M.D., M.S., F.R.C.P., of the Walter and Eliza Hall Institute, Melbourne, which appeared in the Medical Journal of Australia. Describing the symptoms, Dr. Kellaway wrote:—"There is a rapid onset of acute pain commencing in the bitten part, and extending to the limbs and body, associated with acute sweating. There is weakness, numbness, and sometimes paralysis of the limbs. Tremor is frequent. Delirium and restlessness may be present. The cold, clammy sweat, pallor, faintness, and nausea indicate a profound effect on the vaso-motor system. The acute illness lasts from one to three days, and is not fatal in adults. Convalescence is slow, and various skin rashes may appear during its course."

Rural Topics.

Herd-recording and Yield Improvement.

Every farmer who has submitted his herd for recording under the scheme administered by the Dairy Branch of the Department of Agriculture and Stock should appreciate fully the possibilities of the scheme. This idea is well backed by dairy experts below the Border, as is evident in an article in the current "Agricultural Gazette of New South Wales." It is considered that several failures to establish considerable increases in the herd production have been mainly due to insufficient understanding of the methods to be adopted in applying the results, and also to insufficient information having been recorded as to the breeding of the heifers that are being added to the herd from time to time.

It is wise, the writers point out, to record the details and the results of all the operations on the dairy farm. It is suggested that the first essential is the keeping of a permanent herd register. This should consist of a strongly-bound, small book, and all the foundation cows—i.e., those in the herd at the commencement of the compilation of the herd register, should be entered and allotted a number. Any new cow or heifer added to the herd will be allotted the next consecutive number. For instance, in an initial herd of forty cows, the foundation cows will be numbered 1 to 40. When a newly-calved heifer is added to the milking herd, she will be allotted number 41, and each subsequent addition will be allotted the next consecutive number until 999 is reached, when the numbers might be commenced again from one.

This identification number should be indelibly marked on the cow either with a tattoo outfit or with firebrands. In the case of a tattoo it is suggested that the number be placed in the left ear, whilst in the case of the use of firebrands, the number might be placed on the milking-side shoulder, the hair being clipped from around the part where it is intended to brand so as to ensure a clean, neat brand. Only when a cow or heifer has been added to the milking herd should the branding be carried out.

In this register should be kept particulars of the breeding of each cow entered, also any known particulars as regards the production of the dam, grand-dam, &c. The book should be large enough to enable entries to be made in it for a number of years.

The next requirement is the compilation of an annual register, and for this purpose a small cheap exercise book should be purchased. In this book should be kept a complete record of the monthly activities of each cow in the herd. The amount of milk, percentage of butter-fat, and the amount of butter-fat produced by each cow for the month, together with notes on the seasonal conditions, dates of service and by which bull served, date of calving, age of cow at the commencement of recording, sex of calf, name or number allotted to calf and details as to the final disposal of calf—i.e., whether kept for the purpose of later admitting to the milking herd or whether summarily disposed of—should all be recorded on a separate page for each cow. This book will be found to be a valuable adjunct to systematic dairying, since it will enable the farmer, at a moment's glance, to be fully aware of any particulars in regard to any cow in the herd.

Trees on the Farm.

Those who have given some attention this winter to farm improvement by tree planting are reminded that if their enterprise is to be properly rewarded the young trees must be protected from injury, and given a degree of assistance in their development.

The chief danger threatening young trees on the farm and pastoral area is damage by stock, and it is useless making plantings unless the whole of the area is effectively fenced off from animal invasion. Stock not only destroy or injure young plants, but by trampling and packing the soil nullify the effect of preparatory cultivation. The fence should be stock-proof, and either permanent in character or sufficiently well constructed to keep out stock until the trees are beyond the reach of the largest animals. As the trees grow older stock can be admitted from time to time with advantage, as they serve to destroy weed growth and lessen the danger of fire by removing surface litter. A permanent fence with a properly constructed gateway permits the regulation of such entry. Where it is only intended to protect the trees until sufficiently well grown to be proof against stock damage, a barbed wire fence is very effective.

Where single shade or ornamental trees are planted out they should be protected by some form of tree guard. Protecting fences or tree guards should be provided for before the young trees are planted out.

It may be imagined that an ordinary ground fire running through an area of well developed trees would do little harm, but such fires are often hot enough to scorch and kill the living cambium layer just beneath the bark and outer wood, without the tree showing very evident injury. This results in cessation of growth in that portion, and commencement of decay, such fires being often the cause of many trees being rotten at the base. Fire scars are also formed which deepen with every burn, eventually undermining the tree and paving the way for the entrance of timber-destroying fungi and insects. The surface roots of trees are injured and valuable humus burnt out. Any young growth is destroyed.

The area under trees should be cultivated two or three times a year, especially for the first two or three years, in order to keep down weeds, prevent undue evaporation of moisture, and maintain good soil conditions. Weed growth in the early stages is particularly injurious, as it tends to suppress or completely destroy young tree growth, especially of the slower growing species. Weeds, moreover, increase the danger from fire, and reduce the available moisture supply. Under certain conditions, however, weed growth is of value in providing shelter for trees which are liable to injury by excessive heat, frost, &c., and on slopes and shifting sandy soil is of assistance in binding the soil.

Where a cultivator can be used, operations are simplified, but where it is not possible to employ a machine, the trees should be periodically hoed around. Cultivation is particularly desirable in dry areas, and frequently means the difference between success and failure. Cultivation may usually be discontinued as soon as the canopy of leaves offers protection to the soil, or when surface roots interfere with operations. In rabbit-infested country the trees may have to be protected by netting.

Mistletoe growth should be removed as soon as observed. As the roots of this parasite extend below the surface of the wood the whole of the branch infested should be sawn off and burnt where possible.

In many cases there will be a small amount of loss in the trees planted, and these should be replaced as early as possible. Most losses will occur in the first month or so, and replanting should be made immediately. If left until the next season, the "replants" will seldom catch up to the older trees, and are liable to suppression, except where spacing is wide.—A. and P. Notes, N.S.W. Dept. Agric.

The Premier on Marketing Problems.

Speaking at a Show week function, the Premier (Hon. W. Forgan Smith) referred to the Brisbane Exhibition as a great co-operative effort, in which all those who believed in good citizenship played their part; and no association played its part better than did the Royal National Association. The Governor and the Prime Minister had referred to the amazing productivity of Queensland, and the finding of markets for the State's products. There could be no doubt that the continuance of the economic crisis had made the finding of new markets and the maintenance of existing ones very difficult indeed, but that was no reason why they should despair of the future. The industries one glimpsed at the Show had all had their beginning, and the beginning in some cases was comparatively recent. What they saw that day was the accumulated result of the enterprise, initiative, and industry of those who pioneered this country. The present generation enjoyed the advantages of the pioneers' work, and it was their duty to play their part to preserve those industries, and to hand them on to succeeding generations. Thus could we progress and prove our worthiness of a great heritage. It was unthinkable that Australia should agree to any arrest of development or to restricted production. He agreed that new markets could be found if we sought for them properly and tried hard enough. However, it was essential that Australia should maintain a uniform standard of quality, and must trade to sample if the custom were to be held.

Considerable advantage could be obtained by a system of orderly marketing throughout the year, added the Premier. Through the Acting Agent-General (Mr. L. H. Pike) he had been in close touch with market conditions in London. Britain, of course, was trying to build up her markets to the benefit of her own agriculturists. Economic nationalism was a policy that was being pursued throughout the whole world, and that made it more difficult to get trade. However, Queensland was capable of working out her own destiny in her own way if the people were only brave enough to make the effort. However much they might disagree on non-essentials, he thought it would be agreed that there should be a common effort on the part of all good citizens to attain that standard of comfort and decency which people had a right to demand.

The Hide worth more than the Carcass.

From the "British United Press":—A farmer at Windhoek, South-west Africa, sold an ox to a local company for 16s. 6d. A little later he thought he would like to have the hide to make reins. So he went to the company and asked the price. "Seventeen and six," he was told. The farmer now invites the world to tell him just how it is that so small a part should be worth more than the whole.

Pig Research.

A sum of £500 annually has been made available to the Minister for Agriculture (Mr. Frank W. Bulcock) by the rural credits section of the Commonwealth Bank for carrying out research work among pigs in the next two years.

The Minister said recently that he had received this notification from the Premier (Mr. W. Forgan Smith). At the end of two years the grant would be reviewed, and its continuance would depend upon the use that had been made of the money in each year.

Associated with the pig experimental work were certain poultry experiments, and on the recommendation of the Animal Health Board it had been decided to appoint a qualified observer to conduct the nutritional tests.

Dairy Industry's Contribution to Queensland History.

The Minister for Agriculture and Stock (Hon. Frank W. Bulcock) said at the opening of the Dairy Hall at the Brisbane Exhibition that the dairying industry had made some important contributions to the history of Queensland. The history of such a State was written in terms of primary production. Mention had been made of the co-operative movement. That movement, together with the invention and distribution of separators, had made the industry what it was to-day—a movement of people who recognised the grand old maxim, "United we stand, divided we fall." Co-operation had done more than any other single factor towards the advancement of the industry.

The Minister traversed the difficulties confronting the industry, and the victories won by patient effort, claiming that Queensland was a pattern to the whole of Australia, and was frequently appealed to for advice.

Mr. Bulcock hoped that the time would not be far distant when those engaged in dairying would have an Australian parity, based on Australian conditions of livelihood. They should not, he said, apply one principle to one section of the community, and refuse to apply it to another. He congratulated the dairying industry and those who joined with them in staging the fine exhibit, and expressed pleasure in declaring the new Dairy Produce Hall officially open.

Fewer and better Cows—The Secret of Profitable Dairying.

Fewer and better cows should be the aim of every dairy farmer. This contention is well supported in a bulletin of the Idaho (U.S.A.) University. Of the following herds, asks the publication, which is the best?

(1) Twenty-two cows, each producing 200 lb. fat, returning 1,000 dollars over feed cost.

(2) Twelve cows, each producing 300 lb. fat, returning 1,000 dollars over feed cost.

(3) Nine cows, each producing 400 lb. fat, returning 1,000 dollars over feed cost.

The correct answer, replies the writer, is "Herd No. 3," because while each herd returns 1,000 over feed cost—

The 22-cow herd produced 800 lb. fat (22 per cent.) more than either of the other herds, which tends to build a surplus and depress prices.

The 22-cow herd required 38 per cent. more feed than the 12-cow herd and 58 per cent. more than the 9-cow herd.

The 22-cow herd required more time and labour and greater expenses in shelter and taxes than either of the other herds.

The 12-cow herd produced butter-fat at a feed cost of 24 per cent. lower than the 22-cow herd.

The 9-cow herd produced butter-fat at a feed cost 32 per cent. lower than the 22-cow herd.

Sweet Potatoes.

During recent years in New South Wales, the sweet potato has become more popular as a vegetable, largely due to a general improvement in quality in the varieties grown by farmers. This crop attains its best development in the warm coastal regions, and the varieties which have been popular up to the present are Nancy Hall, Yellow Strassburg, and Southern Queen, which were introduced from the United States of America some years ago.

With a view of further improvement on these varieties the Plant-breeding Branch of the Department has been active during the past few years in introducing additional new varieties as well as seed for raising new seedling varieties. This work is being carried out by Mr. W. H. Darragh, Grafton Experiment Farm. Mr. Darragh reports that Brook's No. 3, a seedling variety originated by Mr. G. B. Brooks, of the Queensland Department of Agriculture, is vastly superior in yield at Grafton to the above-mentioned varieties, and another called Hawaii (being an unnamed variety introduced from that country) is also superior to them. It is expected that when these varieties become better known they will largely supplant the American varieties.

A few additional promising seedlings raised from seed introduced from Hawaii are also under observation at Grafton.

Tanning Pig Skins.

Of all skins likely to be tanned on a farm, pig skin is probably the most difficult to handle, and, unless the operator has plenty of time and patience and is in no hurry, it would be better to send such skins to a recognised tannery where they could be tanned under modern conditions and a good job guaranteed. Tanners charge from 8s. each upwards for tanning pig skins of from bacon pig to breeding sow size, plus freight charges.

To prepare a skin for tanning, exercise considerable care in removing it from the pig carcase to avoid cutting holes in the skin, for these ruin the finished product and make it unsightly. The experienced tanner suggests using a sharp axe as a knife, and not the ordinary butcher's knife, the axe to be used after opening up, like using a knife, the objective all through being to remove as much fat and flesh as possible and to have a clean skin. When removed from the animal, spread the skin on a board about the width of an axe, or a little wider, on a slope about waist high so that the operator can lean against the skin to hold it; then use the axe in a shaving method to remove fat and gristly portions. After cleaning the skin in this manner, lay it out flat on a clean board floor and cover well all over with plenty of salt for about a fortnight. If a sharp axe is not available and a knife must be used, use it as in shaving and not in cutting; when rough fat has been removed and skin is clean the salt will penetrate.

It may be advisable to try removing more fat after a day or two and resalting afresh, as the fat is very resistant. If required, a tanning pickle can be made, using salt and water, sufficient salt being added and well stirred to make a potato float. Soak the skin in this pickle for a few days, and then salt for ten days as suggested, and then dry.

If the skin is a valuable one, the small amount of money required to have it prepared at a tannery would be money well spent.—From notes supplied by Mr. C. A. Albrecht, of Musgrave terrace, Alderley, Queensland.

Selection of Seed Maize.

Select ears which are heavy in proportion to their size when dry. Soundness, weight, plumpness, and good bright colour of grain are of more importance than depth of grain. Deep grain may be light and chaffy and of poor colour and feeding value. Select ears true to type or thoroughly representative of the variety. Avoid ears with wide furrows between the rows of grain. Soft, rough-dented grain is more likely to carry the infection of root, stalk, cob, and grain rot disease than medium-hard grain of smooth to medium-rough dent. Do not strive too much after small cores. Well-filled tips make a good show point, but poorly filled tips do not necessarily disqualify otherwise good seed ears. Straight regular rows are only a fancy show point, and need not be stressed greatly in selecting seed. Avoid selecting ears showing split, mouldy, or darkened grains, as they are indicative of infection from root and stalk disease. Also avoid ears which on being detached from the stalk show a shredded, stringy, or discoloured (especially pink coloured) stalk attachment. Avoid ears which shell grain with a stringy tip cap.

Care of the Spray Pump.

Before putting the engine of a power spray plant away for any lengthy period, all working parts should be wiped down and well swabbed with oil. The outfit should be kept under cover from the weather. Unless oil sprays are being used (which do not cake around the valves or chambers or corrode the metal), the pump should be rinsed every night on completion of spraying. Care should be taken in doing this first to rinse the tank out and then pump through clean water with the hoses off to give a clear outlet.

The hose also should be rinsed every night by pumping water through it with the nozzles off: if oil has been used soda should be dissolved in the water used for rinsing, a cask of prepared soda solution for this purpose being kept on hand during spraying operations. The operation should be carried out either after the pump has been first thoroughly rinsed, or with a separate small pump.

Care in this way will lengthen the life of a hose to a very appreciable extent. The thorough drying out of the hose when put away has not been found to be necessary: in fact, provided it is from clean water, moisture in the hose is possibly beneficial. Avoid, however, hanging the hose close up to an iron roof or in any hot place. It should be kept covered with bagging or similar material.

Trees on the Farm—Homestead Shelter Belts.

Shelter belts about the homestead serve a dual purpose. They increase the comfort of the dwelling, making it a much more pleasant place to live in, and also provide an attractive setting or background for the buildings. They may also be used for screening off unsightly buildings, stock yards, &c.

Very little attention is usually given to the planning of the homestead and its surroundings, but consideration of the needs of the locality, combined with a proper planting scheme, would add considerably to the comfort of the one and the benefit of the others. For instance, where ground is not expensive, a 5-acre tree lot of 20 by 40 rods could be planted on the western side of the homestead. This would not only cut off the bleak or hot westerlies, but would form a source of timber supply for all farm needs, apart from the picturesque effect it would give to the holding. Along the southern side a shelter belt could be planted of one or several rows of trees, according to the ground available. The orchard and vegetable garden could be located within the protected area.

Such belts should not be planted too close to the house, as the trees would unduly shade the buildings during the winter months, fire risk would be increased, and tanks and drains would be blocked up by leaf litter. Further, close planting tends to spoil the individuality of the homestead building, more distant planting providing a much more effective background. The nearest shelter should be not much less than 100 yards from the dwelling, the intervening ground being planted with individual shade and ornamental trees if so desired. Planting too close to dairy or stock yards is particularly undesirable, as the shading in winter makes them wet and sloppy.—A. and P. Notes, N.S.W. Department of Agriculture.

Milk for Chickens.

The value of milk for chickens is generally recognised, but it is perhaps not so well understood that when fed in conjunction with other foods it has a value far beyond that which its chemical constituents would indicate. Milk is of great value as a liquid with which to mix the soft food, owing principally to its vitamin content.

Many operators give their chickens milk to drink. This may work well enough with small lots run with hens, but it is most objectionable and dangerous when large numbers are run together in heated brooders, or where they have to crowd together for warmth. Milk cannot be given to chickens to drink without their down and feathers becoming besmeared with it, and an insanitary condition is thus created which is likely to encourage disease—in fact, it may bring on the very condition that one often sees sour milk recommended to cure—namely, diarrhœa.

In no circumstances should milk form the only liquid given to chickens to drink. Water should always be available to them in addition.

Organised Marketing.

Consequent on the High Court judgment in what is known as the peanut case, the early introduction of legislation which may vitally alter the constitution of the Queensland Council of Agriculture is contemplated to meet the new position.

At the same time, the strengthening of the usefulness of the Council and a revitalising of the Local Producers' Associations will be objectives.

The announcement was made by the Minister for Agriculture and Stock (Mr. F. W. Bulcock) when, at the annual meeting of the Council of Agriculture, he was acknowledging his re-election unopposed as president of what, he said, was in essence a "farmers' parliament."

The past twelve months, he declared, had been a time of unprecedented difficulty for the organisation, and they now were on the threshold of a new era. Now that the judgment in the peanut case was known they could go ahead with a policy of reconstruction, making a determined effort to meet the difficulties with which they were confronted. The need for a co-ordinated orderly form of marketing was recognised, and he could not for a moment believe that there ever could be any return to the old chaotic form of marketing their primary produce. Such a retrogression would be disastrous for the individual, the industry, and the State, for primary production was the base of the wealth of the State, and with the prosperity of the producers was inextricably linked the welfare of the whole.

"I expect big changes will take place in the coming year," continued Mr. Bulcock. "At present I have a Bill that may vitally alter the conditions under which we meet to-day. There may be some factors associated with the peanut judgment which may cause me to make some material changes in the constitution of our organisation. As president of the organisation and a member of the Government I give you my honourable assurance that whatever I do will be done with due regard to the interests of the primary producers and primary production generally. There will be no emasculation of the organisation, but rather the giving of further strength to it to pursue the objective and functions for which it was created."

From the testing time of the last twelve months the Council of Agriculture had emerged with unimpaired strength and ever higher in the respect of the people for the manner in which it had faced the difficulties. Pessimists, often interested parties, had urged that with the peanut judgment they were at the end of their sphere of usefulness, and that the organisation should be abandoned. The position was entirely to the contrary, and with the loyal co-operation of the farmers themselves and of the contributory units great progress was in sight. Thus he thought the next move would be to broaden the sphere of the organisation as, in effect, the economic advisers to the body of people who were the producers, and also to give the local producers' association units of the organisation some added objective for which to strive.

He pointed to the community of interest between all forms of primary production, pastoral, dairying, or general agriculture, and said he would like to see the local producers' associations more intimately associated with experimental work, supplementing that done by the Department of Agriculture and Stock, and in co-operation with it. Among many other valuable lines of experiment was that, for instance, associated with grasses. He saw no reason why every local producers' association should not engage in experimental work of some kind. That would materially tend to the rejuvenation of the local producers' association spirit, for they would be contributing to the well-being of their district and State and additionally demonstrating their value. He pointed to the progress made in Britain, America, and Germany in primary production organisation, and expressed the belief that Queensland, through its organisation, could make a very valuable contribution towards the solution of world problems—a solution which could not be found through limitation of production.

ELECTION OF OFFICERS.

The Minister was appointed president on the nomination of Mr. J. McRobert, seconded by Mr. H. T. Anderson, and supported by Messrs. W. L. Osborne and C. Bateman. Mr. Jas. McRobert was elected vice-president without opposition. The following were elected members of the executive:—Messrs J. McRobert, W. J. Sloan, H. T. Anderson, and J. C. Brimblecombe (representing the commodity boards), and V. Baker, J. Gargan, and W. Fielding (district representatives).

Salt for Pigs

In an article "Salt for Stock" in *The Scottish Journal of Agriculture*, Mr. W. Thomson, of the Rowell Research Institute, Aberdeen, says that the belief that salt is "poison" to pigs is difficult to understand when it is realised that pigs fed on kitchen refuse, hotel swill, &c., would obviously be having their food seasoned with salt to the human taste. In present-day practice at Research Stations pigs are regularly fed rations containing 1 to 2 per cent. of salt, and those fed on large amounts of potatoes and maize will readily lick salt placed in their pens.

In a test to determine whether salt had toxic (poisonous) effect, increasing amounts up to 2.5 oz. of salt per day were fed to pigs without any harmful results, the animals gaining normally in weight. One concludes from this study, says the writer, that it pays to give pigs access to salt at all times. These conclusions are on the assumption that water is also available for the use of the pigs at all times, for it is well known with humans that the more salt we eat the more water we need to drink, and if the pig is fed on increasing amounts of salt in the absence of water, results would probably be disastrous.

Young Farmers in the Old Country.

A young farmer in England is anyone of either sex between the age of ten and twenty-one who is a member of a young farmers' club. Such a member looks after poultry, a calf, a pig, sheep, rabbits (in the United Kingdom, of course), bees, or a garden in which vegetables and flowers are grown. They keep records of their work, and their accounts show the money they receive for the sale of their stock and produce and the money they spend on feeding stuffs, manures, and so forth. They choose a committee from among themselves, with a chairman to preside, and secretary to write minutes and letters, and a treasurer to keep club accounts. This committee arranges the meetings at which young farmers and others discuss the feeding of animals, the cultivation of the soil, and similar topics. The clubs also arrange shows at which their livestock and their vegetables and flowers are exhibited, and where they compete for prizes offered by various bodies. All affiliated young farmers are entitled to wear a young farmers' badge. All persons wearing this badge are friends of one another.

Each farmer club has a leader, an older person, who helps any member who wants help and advice in his work. The clubs also have an advisory committee composed of older and more financial persons who are experienced in stock-raising and gardening. This committee helps any member, especially with the buying and selling of stock and produce. Young farmers can buy and read a paper called *The Young Farmer*, which is published quarterly. This paper is full of pictures and articles about young farmers and their work. There are young farmers' clubs all over England and Wales, and the organisation works under the auspices of the Ministry of Agriculture and Fisheries, London.

Council of Agriculture.

In conformity with an amending Act passed last year an Order in Council has been issued declaring that the number of members of the Council of Agriculture shall be twenty-seven.

The Primary Producers' Organisation and Marketing Acts provide that the council shall consist of the Director of Marketing, representatives of commodity boards, the Committee of Direction of Fruit Marketing, and the State Wheat Board, also one representative for each of the nine districts embracing local producers' associations. Regulations have been approved which prescribe the nine districts embracing the local producers' associations. Provision is also made for the appointment, at the annual meeting of the Council of Agriculture, of an executive committee, consisting of not more than ten members. The committee shall include the president, vice-president, Director of Marketing, two representatives of the Butter Board, two representatives selected by, and from among all representatives of the council, with the exception of the district representatives and three representatives selected from among the nine district representatives.

A special regulation has been issued prescribing the members of commodity boards who shall be members of the council, and these include two representatives of the Butter Board, Mr. J. McRobert, of Maryborough, and Mr. W. J. Sloan, of Malanda; one representative of each of the remaining boards; Messrs. H. T. Anderson, Biddeston (Cheese Board), J. Beck, Stanwell (Cotton Board), W. Bailey, Atherton (Atherton Maize Board), C. Brumm, Woongoolba (Arrowroot Board), N. J. Christiansen, Wooroolin (Peanut Board), C. W. Edwards, Kingston (Honey Board), H. Kessler, Cambooya (Barley Board), A. McLauchlan, Boonah (Egg Board), H. Niemeyer, Hatton Vale (Broom Millet Board), G. D. O'Neill, Allora (Canary Seed Board), H. T. Skennar, Malanda (Northern Pig Board), W. Ranger, Brisbane (Committee of Direction of Fruit Marketing), G. Johnson, Mackay (Queensland Cane Growers' Council), and W. J. Brimblecombe, Pirrinuan (Wheat Board).

The Governor in Council has appointed the following representatives of Districts Nos. 1 to 9, embracing local producers' associations, to be members of the Council of Agriculture:—J. E. Harding (Dalma Scrub), No. 1 Central Queensland; V. Baker (Gayndah), No. 2, the Burnett; W. L. Osborne (Wondai), No. 3, South Burnett; E. Brabiner (Green's Creek, Gympie), No. 4, Wide Bay; C. Bateman (Woodford), No. 5, East Moreton; W. A. Fielding (Blenheim), No. 6, West Moreton; J. Buckley (Rose Hill), No. 7, Darling Downs; W. E. Ashford (Hannaford), No. 8, Western Downs; J. Gargan (Atherton) No. 9, Atherton Tableland.

To Keep Weevils out of Stored Skins.

When skins are to be stored some time, especially in the summer months, it is advisable, as soon as possible after they have cooled off, to paint the pelts with some solution to keep away weevils and other pests, which do considerable damage by eating into them, thus reducing their value. Once the weevils get into the skin it is a difficult matter to remove them, and the longer they remain the more damage they do. Care must be taken to paint the pelt thoroughly, as unless this is done the weevils get in at the points and in small pockets and soon riddle the whole piece.

Cheap and effective mixtures for this purpose are made up as follows:—

(1) Arsenic, 4 oz.; soda crystals, 8 oz.; water, 1 gallon. Boil all together until dissolved, and when cool apply with a soft brush.

(2) Arsenic, ½ lb.; soda, ½ lb.; water, 1 gallon. Boil for half an hour.

(3) Arsenite of soda, 1 lb.; water, 4 gallons. Boil together.

(4) Soda ash, 5 lb.; Barbadoes aloes, ¼ lb.; water, 4 gallons. Boil together, and when the mixture rises pour in 1 gallon of cold water. One part of this stock solution to five parts of water would be the proportions to use when required.

All of these mixtures are highly poisonous, and must be legibly branded as such. When not in use keep under lock and key.

These mixtures are also used for painting dry hides and all descriptions of marsupial skins. Paint the pelts with the solution, using an ordinary whitewash brush. Be careful to see that the pelts are thoroughly dry before bundling, as wet skins soon go mouldy and depreciate in value.

White Wash on the Dairy Farm.

Whitewash is generally considered indispensable on the dairy farm. Poorly made and improperly applied, however, it can become a source of trouble when it flakes off or cracks in such a way as to provide harbour for dust and filth.

In the first of the recipes given hereunder tallow or fat is included. Some dairymen object to the use of such substances in whitewash, though if mixed thoroughly with the lime during the process of slaking they lose much of their fatty properties, and for the peace of mind of those who prefer whitewash without fats or oils as binders a second recipe is given. Recipe No. 2 is not suitable for galvanised iron, whitewash containing any appreciable quantity of salt having an injurious effect.

Recipe No. 1.—Obtain, if possible, large pieces of fresh lump lime, place them in a very large bucket or other suitable container, and into this pour hot water. Cold water will do, but hot water is better, as it hastens the slaking. The lime will start to boil and break up. Keep it covered all the time with about half an inch of water. This is important, for if whilst the lime is slaking it is allowed to rise up above the water in a dry powder it will "curdle." Before the lime commences to boil fiercely, add tallow or common fat in the proportion of about 1 lb. to 14 lb. of lump lime. This makes a good binder which will prevent the wash from rubbing off. When the lime is thoroughly slaked it should be stirred and sufficient water added to make it a little heavier than, say, milk, after which it should be strained and, if desired, may be applied whilst hot.

Recipe No. 2.—In a manner similar to that described above slake half a bushel of lime. Then strain the liquid through a fine sieve or strainer and add to it a quarter of a bushel of salt previously dissolved in warm water. Next take 3 lb. ground rice boiled to a thin paste, and stir in while hot ½ lb. Spanish whiting and 1 lb. of clear glue previously dissolved by soaking in cold water and then hanging over a slow fire in a small pot hung in a larger one filled with water. Add 5 gallons of hot water to the mixture, stir well, cover it from dirt, and let it stand a few days. For best results this whitewash should be applied whilst hot.

Licks for Sheep—Economies in their Use.

Most stockowners are in the habit of providing some kind of lick for their stock, but it is safe to say that relatively few of them are fully aware of the chief requirements of such a lick and of the best and cheapest manner of supplying the essential ingredients. Many have adopted an empirical formula, which actually supplies very few, if any, essential constituents. Others purchase proprietary mixtures at relatively high cost, and while the results are in some cases good, the price actually paid is out of proportion to the gain obtained.

Lime-water for Calves.

Besides being a necessary mineral constituent for all classes of animals, lime acts also in correcting acidity in the stomach. It also renders the curd portion of milk readily digestible, particularly by young calves.

Lime-water of the requisite strength is easily made on the farm. There need be no fear of making it too strong, as water will only dissolve a certain limited amount of lime—½ grain to the ounce, or 10 grains to the pint. Add a bucketful (say, 20 lb.) of lime to about 10 gallons of water in a wooden barrel, stir well, and allow to settle. The clear liquid resulting can be used, and water added and stirred daily until all the soluble portion of the lime has dissolved—the lack of alkaline flavour will indicate when this point has been reached, and a fresh supply of lime should be added to the barrel.

Points in Maize Cultivation.

The improvement of the fertility of the soil is one of the most important methods of increasing the yield of the maize crop. Following are some hints in this relation:—

1. It is practically impossible to make the soil too rich for maize. This does not apply to some other crops.

2. Some other crops will make better utilisation of poor land or even second-class soil than maize.

3. Some rotation or change of crops is desirable in maize-growing.

4. Where land receives periodical enrichment by silt from flooding, the fertility of the soil is usually well maintained; but where this is not the case, recourse must be had in time to artificial methods of maintaining or increasing the fertility of the soil if good yields are still to be obtained.

5. Grass pasture, or perennial or biennial crops like lucerne and the different clovers, are the best crops to precede maize. The following results were obtained at one of the New South Wales Department's farms:—

Maize after oaten hay	21 bus. 22 lb. per acre
Maize after red clover	43 bus. 15 lb. per acre

6. Farmyard or stable manure, where readily procurable, is the most valuable manure for maize. Tests in America over thirty years have given an average increase of 25 bushels per acre in the yield of maize from a moderate periodical dressing of animal manure.

7. Green manuring with, or the feeding off of leguminous crops like cowpeas, soybeans, vetches, and field peas increases the yield of the succeeding maize crop. The following results were obtained at a departmental farm in New South Wales:—

Maize after sorghum	49 bus. 40 lb. per acre
Maize after maize	54 bus. 7 lb. per acre
Maize after cowpeas	62 bus. 26 lb. per acre

The fertility of the soil depends in a large measure on the presence of sufficient quantities of humus or organic matter, and of nitrogen, phosphoric acid, and potash in available form. The organic matter and the nitrogen may be well maintained by the foregoing methods, but the mineral requirements of plants in soils deficient in available forms of these ingredients can only be met by the addition of fertilizers. Most soils with continued cropping become deficient in available minerals, particularly phosphates, which are fortunately the cheapest to replace.

The following average results over a series of years have been obtained with fertilizers on maize on farmers' experiment plots in New South Wales:—

	Coastal.	Tumut.	Tableland.
Fertilizer (superphos phate) per acre	2 cwt.	2 cwt.	½ cwt.
Increased yield per acre due to fertilizer	9 bushels	11 bushels	5 bushels
Cost of fertilizer per acre	10s.	10s.	2s. 6d.
Profit per acre from use of fertilizer	£1 10s.	£1 19s.	£1

It must be remembered that fertilizers have their best effect on soils which are well supplied with organic matter, and which therefore hold moisture well.

If a crop does not make use of fertilizer in a dry season, the residual effect is seen in the subsequent crop.

PRODUCTION RECORDING.

List of cows and heifers officially tested by officers of the Department of Agriculture and Stock which have qualified for entry into the Advanced Register of the Herd Book of the Australian Illawarra Shorthorn Society, the Jersey Cattle Society, the Friesian Cattle Society, the Ayrshire Cattle Society, and the Guernsey Cattle Society, production charts for which were compiled during the month of May, 1933 (273 days period unless otherwise stated):—

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORNS.				
MATURE COW (OVER 5 YEARS), STANDARD 350 LB.				
Kilbirnie Bella 10th	Macfarlane Bros., Radford	14,604·84	615·699	Mowbray of Darbalara
Olive 10th of Cedar Grove	C. O'Sullivan, Greenmount	12,002·55	468·856	Dandy of Ocean View
Plum of Glenleigh	C. O'Sullivan, Greenmount	11,199·86	459·434	Alpha
Blue Bell 4th of Morden	Mr. C. A. Littleton, Crow's Nest	9,267·35	414·758	George of Nestles
Penrhos Dove	A. Sandilands, Wildash	7,983·25	359·067	Admiration of Strathdhu
Favourite of Mountside	R. R. Radel, Coalstoun Lakes	8,780·1	350·282	Plum of Hillview
JUNIOR, 4 YEARS OLD (UNDER 4½ YEARS), STANDARD 310 LB.				
Glendalough Queenie III.	Hickey and Sons, Wilston	13,414·95	456·98	Don of Springdale
Olive 12th of Cedar Grove	C. O'Sullivan, Greenmount	10,943·42	417·776	Mabel 2nds Victor of Coral Grange
SENIOR, 3 YEARS OLD (OVER 3½ YEARS), STANDARD 290 LB.				
Lu Lu 4th of Headlands	G. Heading, Cloyna	10,851·01	376·956	Duchess' Jellicoe Fairfield
JUNIOR, 3 YEARS OLD (UNDER 3½ YEARS), STANDARD 270 LB.				
Model 2nd of Alfavale	W. H. Thompson, Nanango	11,331·45	493·664	Reward of Fairfield
SENIOR, 2 YEARS OLD (OVER 2½ YEARS), STANDARD 250 LB.				
Blacklands Emlyn	P. J. Skerman, Kaimkillenbun	6,063·99	311·018	Envoy of Blacklands
Euroa Belinda	H. F. Lindenmayer, Binjour Plateau, Gayndah	7,197·4	280·336	Bright Laddie of Roselea
Wandegong Jean	G. D. Lindenmayer, Mundubbera	7,280	275·062	Emperor of Spurfield
Mermaid 6th of Arley	E. E. D. Lawley, Maleny	6,194·8	270·656	Defender 2nd of Huntleigh
Maud III. of Bellwood	W. G. Currant, Gunalda	6,964·35	254·506	Statesman of Bellwood
JUNIOR, 2 YEARS OLD (UNDER 2½ YEARS), STANDARD 230 LB.				
Millstream Beryl	W. J. Barnes, Cedar Grove	7,628·5	345·927	Magnet of Kurrawong
Balcarres Dot	Mrs. C. A. Littleton, Crow's Nest	7,412·2	331·486	Bugle Boy of Morden
Euroa Viola	H. F. Lindenmayer, Binjour Plateau	8,034	316·250	Bright Laddie of Roselea
Millstream Favourite (249 days)	W. J. Barnes, Cedar Grove	6,591·73	271·964	Wunulla Planet
Lorna 10th of Arley	E. E. D. Lawley, Maleny	5,744·32	234·227	Defender 2nd of Huntleigh

JERSEY.

MATURE COW (OVER 5 YEARS), STANDARD 350 LB.

Trecarne Rosella	T. A. Petherick, Lockyer	9,450·37	563·583	Trinity Officer
Maria of Lyndhurst	J. B. Keys, Gowrie Little Plains	10,157·91	429·03	Rosebuds Milklad of Waaragaburia
Trinity Devotion	F. P. Fowler and Sons, Coalstoun Lakes	7,187·65	400·038	Trinity Governor
Noble Sultane of Brooklands	F. P. Fowler and Sons, Coalstoun Lakes	7,089·75	378·413	Montrose Farms Noble
Sultan's Mabel II. of Brooklands	W. S. Conochie, Sherwood	7,012·92	352·883	Oxford Palatine Sultan

SENIOR, 4 YEARS OLD (OVER 4½ YEARS), STANDARD 330 LB.

Hazelhurst Golden Lilly III.	F. Maurer, Darra	9,232·69	456·598	Carlyle Rural King
Belleefaire Belle Bonbon	F. J. Cox, Imbil	8,077·05	445·057	Masterpiece Yeribee of Bruce Vale

SENIOR, 3 YEARS OLD (OVER 3½ YEARS), STANDARD 290 LB.

Queenie 2nd of Wattle Grove	J. McInally, Brassall	8,652·02	483·536	Golden Palatine of Morago

JUNIOR, 3 YEARS OLD (UNDER 3½ YEARS), STANDARD 270 LB.

Lyndhurst Marella	J. B. Keys, Gowrie Little Plains	9,803·37	507·356	Mercedes Noble King of Ogilvie
Trecarnlea Daisy	T. A. Petherick, Lockyer	6,033·81	304·458	Trinity Officer

SENIOR, 2 YEARS OLD (OVER 2½ YEARS), STANDARD 250 LB.

Trecarne Rosella 4th	T. A. Petherick, Lockyer	7,978·43	449·148	Trinity Officer
Bremerside Sunrise	B. Jensen, Rosevale	6,977	330·02	Oaklands Cream Lad
Bremerside Ena's Pride	B. Jensen, Rosevale	5,831·5	319·037	Kelvinside Noble Chieftain
Trecarne Sweetbread 2nd	T. A. Petherick, Lockyer	5,271·02	279·472	Trecarne King

JUNIOR, 2 YEARS OLD (UNDER 2½ YEARS), STANDARD 230 LB.

Greenstock Poppy	J. B. Keys, Gowrie Little Plains	9,318·11	479·756	Greenstock Commander
Glenview Audrey Twylish	F. P. Fowler and Sons, Coalstoun Lakes	6,129	349·027	Carlyle Larkspur 2nd Empire
Bremerside Flower	B. Jensen, Rosevale	5,831·5	318·003	Kelvinside Noble Chieftain
Waverley Progression	D. R. Hutton, Cunningham	6,460·48	296·05	Oxford Gems Noble III.
Bremerside Belle	B. Jensen, Rosevale	4,868·5	275·818	Kelvinside Noble Chieftain
Daphne of Burnleigh	W. Mallett, Nambour	5,274·25	268·44	Trinity Darby

GUERNSEY.

SENIOR, 3 YEARS OLD (OVER 3½ YEARS), STANDARD 290 LB.

Linwood Columbine	A. S. Cooke, Maleny	6,574·65	353·609	Linwood Royal

JUNIOR, 2 YEARS OLD (UNDER 2½ YEARS), STANDARD 230 LB.

Linwood Treasure (269 days)	A. S. Cooke, Maleny	5,775·3	311·528	Linwood Rival
Linwood Ruby	A. S. Cooke, Maleny	6,006·7	307·502	Moonji Bright Boy
Laurcldale Gem	W. Cooke, Maleny	4,680·45	236·701	Linwood Favour

AYRSHIRE.

MATURE COW (OVER 5 YEARS), STANDARD 350 LB.

Longlands Bella III.	T. Holmes, Yarranlea	9,803·12	377·804	Prince Roy of Fairview

FRIESIAN.

MATURE COW (OVER 5 YEARS), STANDARD 350 LB.

College Pontiac Princess (365 days)	Hickey and Sons, Wilston	24,027·28	829·58	Pabst Pontiac Blue Star

The Home and the Garden.

OUR BABIES.

(Issued by the Queensland Baby Clinics.)

Under this heading we issue a monthly series of short articles dealing with the welfare and care of babies, in the hope of increasing their health and happiness, and decreasing the number of unnecessary deaths among them.

CHILD WELFARE.

MOST important are the early beginnings of all things. Especially is this true of health. On the health of the mother depends the health of the infant; on the health of the infant depends the health of the child; on the health of the child depends the health of the adult; on the health of the adult depends the health of the State; and these must not be left to chance.

Largely they have been left to chance. Of recent years something has been done to promote health, something apart from the attempt to cure disease by hospitals and other means. Let us clearly understand that disease is nothing in itself, but only the absence of health, and that it is by the cultivation of health that we can best diminish disease. If our people are to be healthy, they must learn to think in terms of health, and not in terms of disease. They must pursue the living fact, and not waste their energies in struggling with shadows.

There are three things that are now of the greatest importance. Firstly, the care of the expectant mother. This care is the responsibility of her medical adviser. The Lady Bowen Hospital has an Ante-natal Clinic, so have other Maternity Hospitals, and there are Ante-natal Clinics in the Valley and Woolloongabba. We must so educate our mothers that the excellent work done by all these shall be multiplied tenfold. For want of knowledge mothers and infants die or are crippled in health. Most pathetic is the loss of life and the survival of weaklings owing to the want of this care, which is freely offered to all mothers who will seek it.

Secondly, we need to extend our Infant Welfare work so as to reach as far as possible every mother and infant in the State. In the last fifteen years our infant mortality has fallen by more than one-third. Infant Welfare has well earned the right to further extension and perfection.

Thirdly, the health of the young child is now a pressing problem. Ill-health and deaths from infection are far too common. We must spread knowledge of the ways to prevent the spread of infection and to increase the resistance to infection by a sound diet rich in vitamins. Something has been done in this direction, but much more remains to be done. By special means we can give immunity to diphtheria and typhoid fever, and can surely eradicate hookworm; but against other infections very little has been done.

Let us do these things that we can, and presently we shall be able to do things that are now impossible.

THE FLOWERS O' THE FOREST.

BE TRUE TO THE TREES.

"REDGUM," a noted regular contributor to the "Sydney Morning Herald," has this to say in a recent issue of that journal:—

NEVER at any time was there greater need for kindly thought and action on behalf of our own individual trees and for those which belong to the nation.

The great awakening is near at hand. Men and women are beginning to realise that the tree means something more than fuel for the home fire and wood for building purposes.

For generations we have done our utmost to pull down and spoil the living beauties of the landscape, hoping that the remnants would satisfy our souls and serve our purposes just as well. Over fifty years of spoilation have proved that our ways and works are those of the destroyer and not those of the nation-maker.

Australia has trees which any other people would love and cherish with all their hearts. Her trees and her landscapes, her seasons and her skies are among the greatest of our assets. Only the hand of the axeman can rob us of our tree heritage. This land of brilliant sunshine is made beautiful by our climate and our trees. Only now in these great and inspiring days are men and women learning to realise what power and profit, poetry and pictures our Australian trees may be in themselves. No one who gives his heart to the love of the eucalypts, the flames, the wheel trees, or the pines of Australia will ever have reason for regret.

The whole Japanese nation bows reverently before the glory of the springtime which comes in the soul of the cherry trees. Are our Illawarra flame trees, scarlet eucalypts, and wheel trees any less attractive than the cherry of Japan? No tree that tosses its glory into the air for the eyes of man to feast upon could ever do better work than the queen of the coastal brushlands, which one knows as the flame or fire tree. The city that gives this picture-maker the prominence it deserves will win fame and prove attractive to visitors.

But not in every situation will this exquisite flame tree do its best work. It is a lover of warmth and partial shelter, and should be worth making at home in our coastal parklands even if some of the hardier native subjects have to be used to bear the brunt of the great gales.

Gay and Glorious Gums.

In the same honoured place would I set the colourful gums which are still clamouring for recognition. We have nothing finer around Sydney than the trees growing in Countess avenue, Mosman. There many well-grown subjects have planted themselves in the landscape, with their roots deep in the stony soil.

I saw this company during the early summer when they were at their best, and wondered how it was that so few tree lovers were paying them attention. For sandstone country with a northerly exposure the scarlet gum is a serious rival to the flame tree, which has been given the pride of place.

Next on the list is Queensland's wheel tree, a stenocarpus, with a great colourful heart and a foliage that is hard to equal. The blossoms are massed in brilliant clusters, each flower being shaped like a small wheel with a double set of scarlet spokes which join at the rim and carry a ball of crimson or gold.

The jacaranda, silky oak, Cape chestnut, and catalpa are also among the immortals. Of these I have spoken on several occasions. Every man and woman who loves a flowering tree has a kind word for each of them.

In any place to its liking, the Moreton Bay chestnut can also display powers which are not often seen on or near the suburban roadsides. The foliage is like well-polished duco, and the blooms are orange suffused with scarlet. Heads full of character and charm are pieced together in the early summer. Only for a short time during the winter is there any loss in the colour of the leaves.

Pink Flowered Kurrajong.

The large-flowered pink kurrajong, listed as *Sterculia diversifolia*, will one day be given an honoured and prominent place among Australia's best flowering trees. It is a big grower and carries a large rosy pink bell-shaped blossom with a patch of rosy claret in the centre. For months during the summer the flowering continues. The tree is well known to the owners of scrubland on the lower North Coast. In the Gloucester district it is greatly admired.

A striking and delightful bauhinia often listed as a mountain ebony or butterfly tree can hold its own in any good company. The blooms are not unlike azaleas. They break out of the bark on short footstalks, and at times just smother the whole tree. *Hookeri*, I think, is the name of the variety carrying white flowers that are edged with crimson. The snow-white bauhinia cannot be equalled by any of our warm-country flowering trees.

Among the many brilliant native workers, which our tree propagators have sadly neglected, is a jagera, at one time known as *Cupania pseudo-rhus*. This superb evergreen ripens bunches of ruby-velvet coloured seeds that are carried after the manner of some of the smaller wattles. It is a gem thing, with plenty of character and quality. Quite ninety-nine tree-lovers out of every hundred seeing the rhus-like foliage and the bunches of velvet seeds would fall in love with it at first sight. It is one of the most joyous of our little-known natives and comes, I think, from the coastal scrubs. If half the work attempted with the soulless black fig was given to some of our better class Australian natives, our eyes would be opened wider. Surely we have had enough of our city parklands and suburban streets blighted by the uninspiring members of the fraternity of figs!

A full day's work always lies ahead of the tree planter. On that work the health and happiness of the young trees will always depend. Planting is one thing, holding the young trees together through the long, hot days of summer is quite another.

The history of the public and school tree-plantings done during the last twenty years clearly shows that overmuch energy was displayed at the time of planting, and that too little thought was paid to the young trees after their placing.

For many years prior to the closing of the State Nursery at Campbelltown over 150,000 young trees were distributed free to schools, municipalities, shires, public institutions, and also to private citizens. Not one-tenth of all those young trees were privileged to grow up. What was the reason for their failure? No better stocks were ever supplied to anyone; the fault was not with the trees. All that great misfortune can be debited against the methods of the men and women who permitted the trees to die for want of water and attention.

What After Care Means.

That brings me to the story which I desire to make prominent. Trees that are left to dry out after planting have been thrown away.

We can do the young trees that were planted yesterday or to-day, as well as those that will be planted before the hot weather begins, a great service by determining to act differently in future. As good citizens, we are in duty bound to remain true to the tree children that we plant on the highways and in the great or small gardens.

Too often the trees, both public and private, are planted in places where the hardiest of weed things could not hold itself together. That is where too many of the wrongs begin.

A hole dug in a hard patch of heavy loam, with every facility for the intake of rain, but no provision for draining away the surplus water, that only swamp and bog plants can live with, is one of the commonest of tree-planting faults. Good and thorough preparation of the soil is necessary before any planting is done in heavy land, where the subsoil holds water. In light country little or no preparation for the drainage is necessary. Sandy soils are hard to hold moisture enough to keep the young trees alive.

Watering, too, entails a lot of work. In many places where trees are planted little or no water is available, and no labour can be spared to keep the soil surface open to give the young stocks a chance to profit by the moisture which works through from below the ground line.

In many instances it is far better to refrain from watering young trees early in the summer rather than force them to make a false growth, which they will be unable to maintain. If helped by surface hoeing, young trees and older trees both quickly accommodate themselves to the ruling condition. Where they are forced out of their partially dormant state by watering, which cannot be kept up, they too often succumb to the strain, and die before the change in the weather conditions helps them out of trouble. Trees and flowering plants require mothering all the time. Those which are forgotten very soon fail.

Provide Ample Room.

Do not plant trees that grow, as do most of our gums, in places where they will not be able to display their full beauty. A young silky oak planted within 15 or 20 inches of a dividing fence is quite out of place. An oak or an elm, a fig or a plane, in a corner where there is not room enough for a rose bush, will never be seen to advantage. A street tree placed within a few feet of a telegraph pole is also improperly planted. A row of giant trees grown in hedge formation against a neighbour's fence, too, is a thoughtlessness which should be avoided. If our trees are worth what we think they are, every possible effort should be made to encourage them. We owe to them the best service in our power, and nothing less will repay them for their good work.

Orchard Notes for October.

THE COASTAL DISTRICTS.

OCTOBER is frequently a dry month over the greater part of Queensland, consequently the advice that has been given in the notes for August and September regarding the necessity of thorough cultivation to retain moisture is again emphasised. Unless there is an adequate supply of moisture in the soil to meet the trees' requirements, the coming season's crop will be jeopardised, as the young fruit will fail to set.

Thorough cultivation of all orchards, vineyards, and plantations is therefore imperative if the weather is dry, as the soil must be kept in a state of perfect tilth, and no weeds of any kind must be allowed to grow, as they only act as pumps to draw out the moisture from the soil that is required by the trees or fruit-yielding plants. Should the trees show the slightest sign of the want of moisture, they should be given a thorough irrigation if there is any available means of doing so, as it is unwise to allow any fruit trees to suffer for want of water if there is a possibility of their being supplied. Intermittent growth, resulting from the tree or plant being well supplied with moisture at one time and starved at another, results in serious damage, as the vitality is lessened and the tree or plant is not so well able to ward off disease. A strong, healthy, vigorous tree is frequently able to resist disease, whereas when it has become debilitated through neglect, lack of moisture or plant food, it becomes an easy prey to many pests. If an irrigation is given, see that it is a good one and that the ground is soaked; a mere surface watering is often more or less injurious, as it is apt to encourage a false growth which will not last, and also to bring the feeding roots to the surface, where they are not required, as they only die out with a dry spell and are in the way of cultivation. Irrigation should always be followed by cultivation, so as to prevent surface evaporation and thus retain the moisture in the soil.

All newly planted trees should be carefully attended to, and if they show the slightest sign of scale insects or other pests they should receive attention at once. All growth not necessary to form the future tree should be removed, such as any growths on the main stem or main branches that are not required, as if this is done now it will not only save work later on, but will tend to throw the whole strength of the tree into the production of those limbs that will form the permanent framework of the tree. In older trees all water sprouts or other similar unnecessary growths should be removed.

Keep a good lookout for scales hatching out, and treat them before they have become firmly established and are coated with their protective covering, as they are very easily killed in their early stages, and consequently much weaker sprays can be used. The best remedies to use for young scales hatching out are those that kill the insects by coming in contact with them, such as miscible oils, which can be applied at a strength of 1 part of oil in 40 parts of spraying material, and will do more good than a winter spray of double the strength. In the use of miscible oils or kerosene emulsion, always follow the directions given for the use of those spraying materials, and never apply them to evergreen trees when they are showing signs of distress resulting from a lack of moisture in the soil, as they are then likely to injure the tree, whereas if the tree is in vigorous growth they will do no harm whatever.

All leaf-eating insects should be kept in check by the use of an arsenate of lead spray, taking care to apply it as soon as the damage appears, and not to wait till the crop is ruined. Crops, such as all kinds of cucurbitaceous plants, tomatoes, and potatoes are often seriously injured by these insects, and the loss occasioned thereby can be prevented by spraying in time. In the case of tomatoes and potatoes, a combined spray of Bordeaux or Burgundy mixture and arsenate of lead should be used, as it will serve the dual purpose of destroying leaf-eating insects and of protecting the plants from the attack of Irish blight.

Grape vines require careful attention, and, if not already sprayed with Bordeaux mixture, no time should be lost in applying this material, as the only reliable method of checking such disease as anthracnose or black spot and downy mildew is to protect the wood and foliage from the attack of these diseases by providing a spray covering that will destroy any spores that may come in contact with them. The planting of bananas and pineapples can be continued during the month. See that

the land is properly prepared and that good, healthy suckers only are used. Keep the plantations well worked, and allow no weed growth. Keep a very careful lookout for fruit flies; destroy every mature insect you can, and gather and destroy every fallen fruit. If this is done systematically by all growers early in the season the subsequent crop of flies will be very materially decreased. See that all fruit sent to market during the month is carefully handled, properly graded, and well packed—not topped, but that the sample right through the case or lot is the same as that of the exposed surface.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

MUCH of the matter contained under the heading of "The Coastal Districts" applies equally to these parts of the State; for on the spring treatment that the orchard and vineyard receives the succeeding crop of fruit is very largely dependent. All orchards and vineyards must be kept in a state of perfect tilth, and no weed growth of any kind should be allowed. In the Western districts, irrigation should be given whenever necessary, but growers should not depend on irrigation alone, but should combine it with the thorough cultivation of the land so as to form and keep a fine soil mulch that will prevent surface evaporation.

All newly planted trees should be carefully looked after, and only permitted to grow the branches required to form the future tree. All others should be removed as soon as they make their appearance. If there is any sign of woolly aphis, peach aphis, or scale insects, or of any fungus diseases on the young trees, these diseases should be dealt with at once by the use of such remedies as black leaf forty, Bordeaux mixture, or a weak oil emulsion. In older trees, similar pests should be systematically fought, as if kept in check at the beginning of the season the crop of fruit will not suffer to any appreciable extent. Where brown rot has been present in previous years, two or more sprayings with Bordeaux mixture can be tried, as they will tend to check other fungus growths, but at the same time the sodium or potassium sulphide sprays are more effectual for this particular disease and should be used in preference when the fruit is nearly full grown. All pear, apple, and quince trees should be sprayed with arsenate of lead—first when the blossom is falling, and at intervals of about three weeks. Spraying for codlin moth is compulsory in the fruit district of Stanthorpe, and wherever pomaceous fruit is grown it must be attended to if this insect is to be kept in check.

In the warmer parts a careful check should be kept for any appearance of the fruit fly, and, should it be found, every effort should be made to trap the mature insect and to gather and destroy any affected fruit. If this is done, there is a good chance of saving the earlier ripening summer fruit, if not the bulk of the crop. Tomato and potato crops will require spraying with Bordeaux mixture, as also will grape vines. Keep a very strict watch on all grape vines, and, if they have not already been treated, don't delay a day in spraying if any sign of an oil spot, the first indication of downy mildew, appears on the top surface of the leaf. Spraying with Bordeaux mixture at once, and following the first spraying up with subsequent sprayings, if necessary, will save the crop, but if this is not done and the season is favourable for the development of the particular fungus causing this disease, growers can rest assured that their grape crop won't take long to harvest.

Where new vineyards have been planted, spraying is also very necessary, as if this is not done the young leaves and growth are apt to be so badly affected that the plant dies.

Farm Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore, our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, cowpeas, sorghums, millet, panicums, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants from preparing the ground to harvesting the crop, to which our readers are referred.

CLIMATOLOGICAL TABLE—JULY, 1933.

COMPILED FROM TELEGRAPHIC REPORTS.

Districts and Stations.	Atmospheric Pressure. Mean at 9 a.m.	Shade Temperature.						Rainfall.	
		Means.		Extremes.				Total.	Wet Days.
		Max.	Min.	Max.	Date.	Min.	Date.		
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Points.	
Cooktown	29·99	80	67	85	29	59	27	74	6
Herberton	..	71	53	79	13	38	30	112	5
Rockhampton	30·06	70	55	79	14	44	31	1,952	13
Brisbane	30·10	68	52	74	7	40	19	324	10
Darling Downs.									
Dalby	30·12	65	44	75	13	27	19	257	9
Stanthorpe	..	58	38	65	6, 7, 8	19	19	241	12
Toowoomba	..	60	43	71	12	29	19	554	9
Mid-interior.									
Georgetown	29·97	81	55	88	13, 14	38	26	3	2
Longreach	30·07	68	47	78	1	40	19, 21	410	9
Mitchell	30·11	62	45	72	7, 13	32	19, 22	592	11
Western.									
Burketown	30·01	79	56	86	7, 13	43	10	0	0
Boulia	30·08	70	45	79	12	35	27, 28	6	1
Thargomindah	30·10	66	46	78	12	34	31	9	2

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF July, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING July, 1933 AND 1932, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1933.	July, 1932.		July.	No. of Years' Records.	July, 1933.	July, 1932.
North Coast.	In.		In.	In.	*Central Highlands.*	In.		In.	In.
Atherton	1·00	32	0·94	1·33					
Cairns	1·58	51	0·58	1·42	Clermont	0·92	62	6·82	0·05
Cardwell	1·34	61	3·18	0·71	Gindie	0·87	34	..	0
Cooktown	0·97	57	0·74	0·65	Springsure	1·04	64	9·63	0·13
Herberton	0·84	47	1·12	0·92					
Ingham	1·48	41	3·24	1·00					
Innisfail	4·61	52	4·08	4·07					
Mossman Mill ..	1·23	20	1·23	0·61					
Townsville	0·60	62	1·27	0	*Darling Downs.*				
Central Coast.					Dalby	1·71	63	2·57	0·97
					Emu Vale	1·54	37	1·97	1·20
Ayr	0·66	46	2·07	0·08	Hermitage	1·69	27	2·46	1·44
Bowen	0·89	62	5·19	0·40	Jimbour	1·51	45	2·46	0·65
Charters Towers ..	0·61	51	1·53	0	Miles	1·59	48	3·25	0·65
Mackay	1·59	62	10·08	0·52	Stanthorpe ..	2·01	60	2·41	1·00
Proserpine	1·33	30	9·29	0·70	Toowoomba ..	2·02	61	5·53	1·14
St. Lawrence ..	1·23	62	11·38	0·19	Warwick	1·81	68	2·54	1·71
South Coast.									
					Maranoa.				
Biggenden	1·28	34	3·61	0·30					
Bundaberg	1·75	50	4·33	0·49	Roma	1·41	59	5·04	0·53
Brisbane	2·21	82	3·24	0·27					
Caboolture	2·09	46	4·39	0·35					
Childers	1·61	38	3·94	0·08					
Crohamhurst ..	2·79	40	6·39	0·61					
Esk	1·93	46	3·14	0·44					
Gayndah	1·42	62	3·71	0·45					
Gympie	2·08	63	3·60	0·43	*State Farms, &c.*				
Kilkivan	1·58	54	3·03	0·41					
Maryborough ..	1·82	61	3·30	0·21	Bungeworgorai ..	1·26	19	4·61	0·39
Nambour	2·58	37	5·10	0·40	Gatton College ..	1·32	34	2·91	0·64
Nanango	1·63	51	2·27	0·75	Kairi	1·12	19	1·05	0·78
Rockhampton ..	1·48	62	19·52	0·25	Mackay Sugar Experiment Station	1·33	36	9·64	0·37
Woodford	2·30	46	4·70	0·36					

GEORGE G. BOND, Divisional Meteorologist.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S., AND A. C. EGLINTON.

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

	September. 1933.		October. 1933.		Sept. 1933.	Oct. 1933.
	Rises.	Sets.	Rises.	Sets.	MOONRISE. Rises.	MOONRISE. Rises.
					p.m.	p.m.
1	6·7	5·37	5·33	5·51	2·24	3·30
2	6·6	5·37	5·32	5·52	3·33	4·29
3	6·5	5·38	5·31	5·52	4·39	5·28
4	6·4	5·38	5·30	5·53	5·42	6·26
5	6·3	5·39	5·28	5·53	6·42	7·24
6	6·2	5·39	5·27	5·54	7·41	8·23
7	6·1	5·40	5·26	5·54	8·39	9·20
8	6·0	5·40	5·25	5·55	9·38	10·15
9	5·58	5·41	5·24	5·55	10·35	11·9
10	5·57	5·41	5·23	5·56	11·35	12·0
					a.m.	a.m.
11	5·56	5·42	5·22	5·56	..	..
12	5·55	5·42	5·21	5·57	12·25	12·45
13	5·54	5·43	5·20	5·57	1·16	1·29
14	5·52	5·43	5·19	5·58	2·7	2·5
15	5·51	5·44	5·18	5·58	2·51	2·39
16	5·50	5·44	5·17	5·59	3·32	3·9
17	5·49	5·44	5·16	5·59	4·8	3·40
18	5·48	5·45	5·15	6·0	4·40	4·12
19	5·47	5·45	5·14	6·1	5·11	4·45
20	5·46	5·46	5·13	6·1	5·43	5·23
21	5·44	5·46	5·11	6·2	6·15	6·5
22	5·43	5·47	5·10	6·3	6·48	6·57
23	5·42	5·47	5·9	6·3	7·25	7·58
24	5·41	5·47	5·8	6·4	8·11	9·2
25	5·40	5·48	5·7	6·4	9·4	10·8
26	5·38	5·48	5·6	6·5	10·5	11·14
						p.m.
27	5·37	5·49	5·5	6·6	11·9	12·19
28	5.36	5·49	5·5	6·7	12·15	1·22
					p.m.	
29	5·35	5·50	5·4	6·7	1·21	2·22
30	5·34	5·50	5·4	6·8	2·27	3·20
31			5·3	6·9		4·16

Phases of the Moon, Occultations, &c.

4 Sept.	○	Full Moon	3 4 p.m.
12 ,,	☽	Last Quarter	7 30 a.m.
20 ,,	●	New Moon	4 20 a.m.
27 ,,	☾	First Quarter	1 36 a.m.

Apogee, 12th September, at 7.6 p.m.

Perigee, 25th September, at 8.30 p.m.

The Cross will be upright about 4 p.m. on the 1st, and about 3 p.m. on the 15th, reaching position III. about 10 p.m. on the 1st and 9 p.m. on the 15th, it will then be in an almost horizontal position, about 30 degrees west of the south celestial pole.

The occultation of Saturn by the Moon on the 2nd will take place long after they have set.

Before the Moon sets on the 2nd, Saturn may be seen a little more to the east, but it will be overtaken and passed at 11 a.m.

As Neptune will be in conjunction with the Sun on the 2nd, it will be more than usually invisible.

Mercury will be passing from west to east of Neptune on the 7th, about 4 p.m.

When the Moon passes Uranus, about 6 a.m. on the 8th, there will be an apparent distance of 6 degrees between them.

On the 11th, Mercury will be on the far side of its orbit, in conjunction with the Sun. Its distance from the Earth will be 127,496,780 miles.

On the 19th, Mercury will appear to be only 3 minutes south of Jupiter, from west to east of which it will apparently be passing.

Jupiter will be only 4 degrees north of the Moon at the time of setting, at 6.11 p.m. on the 20th.

On the 23rd the Sun will be passing from the north to the south side of the equator and the Equinox will occur. At 10 p.m. the sun will be exactly half-way round the sky from the First Point of Aries. It will then be technically entering the Sign of Libra, though for a month longer it will still be in the constellation Virgo.

A conjunction of Jupiter and the Sun will occur on the 27th, when the Sun, having overtaken Jupiter, will be passing from west to east of it, Jupiter then being entirely invisible.

The conjunction of Saturn with the Moon on the 29th, about 4 p.m., will be an interesting daylight object, requiring binoculars or telescope.

Mercury rises 26 minutes before the Sun on 1st September, and 12 minutes before it on the 15th.

Venus sets at 8.13 p.m. on the 1st, and at 8.34 p.m. on the 15th.

Mars sets at 9.51 p.m. on the 1st, and at 9.41 p.m. on the 15th.

Jupiter sets at 7.7 p.m. on the 1st, and at 6.25 p.m. on the 15th.

4 Oct.	○	Full Moon	3 7 a.m.
12 ,,	☽	Last Quarter	2 45 a.m.
19 ,,	●	New Moon	3 44 p.m.
26 ,,	☾	First Quarter	8 20 a.m.

Apogee, 10th October, at 2.54 p.m.

Perigee, 22nd October, at 10.24 a.m.

For places west of Warwick and nearly in the same latitude, 28 degrees 23 minutes S. add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhat about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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